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A COMPARATIVE ANALYSIS OF COMPREHENSION QUESTIONS CONTAINED IN THE MANUALS OF TWO CANADIAN BASAL READING PROGRAMS

by

CHERYL HITCHCOCK

A THESIS

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Date November 9, 1982

Dedicated to My

Parents,

Mr. and Mrs. Wayne Hitchcock

ABSTRACT

The purpose of this study was to analyze and compare the comprehension questions contained in the teacher manuals of two Canadian basal reading programs at the Grade Five level. The methodology was aimed at determining the complexity of thought processes required and the organizational strategies used for developing comprehension. A five-part instrument, the Question Categorization System, was developed by the researcher and used to analyze the nature of the comprehension questions. Organizational strategies were studied by analyzing the sample for evidence of a Taba sequence of focus, extend, and/or lift questions.

Questions, pertaining to 56 stories and poems, were drawn from the manuals creating a total sample of 616 questions. Within this sample, there were 507 questions with answers dependent on knowledge of the written text. These questions, referred to as text dependent, were categorized according to the Question Categorization System. The five categories in the System reflect the range of information sources a reader might draw from as well as the cognitive operations engaged in when answering a question. The remaining 109 questions, were text independent.

Question sequences were located and each question was marked as either a focus, lift, or extend question according to the Taba model. Results were summarized to indicate the proportion of sequenced questions within each reading series and the categories of questions being used within sequences.

Questions which require the reader to select and organize information, therefore involving complex mental processing, were emphasized to a greater extent than questions which require simple mental processing. Sequence patterns (focus, extend, and/or lift questions) were evident in only 34% of the total questions. At least half of these sequenced questions involved simple mental processing and forced the reader to choose a prescribed opinion stance, often embedded in the teacher question. Although a major portion of the total sample of questions was aimed at development rather than assessment, this goal would have been strengthened if a greater number of complex processing questions had been presented in purposeful sequences.

Manuals from the Ginn and Nelson reading programs differed in the quantity of comprehension questions provided; in the balance between actual questions and suggestions for question topics; and in the emphasis placed on the text independent questions aimed at providing background knowledge and developing vocabulary. Program manuals also differed in the distribution of simple and complex processing questions within the Taba sequences, however the two programs were similar in the proportion of questions organized into sequences.

Implications for comprehension instruction and for further research were suggested.

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1. INTRODUCTION

Questions have been used as a major teaching tool for centuries. Socrates, one of the greatest teachers in history, was noted for his skill at using a clever sequence of questions to guide his students to the discovery of knowledge. Through responding to the questions, the learner integrated knowledge, that was called forth during the questioning. In the process, the student was forced to assume an active participatory role in learning (Ausubel, 1968).

Preservice teachers are taught how to ask questions and instructional manuals attempt to shape classroom use of this teaching tool. Therefore, it seems important to not only investigate information related to the "art of questioning", but also, in light of this information, to study the nature and organization of questions contained in teacher manuals.

Questioning has been described as a method for directing and developing students' thought patterns (Austin, 1949). According to Bruner (1960), questions should move students ahead more quickly in their intellectual development. Jenkinson (1975) stated that the "posing of provocative questions" is an effective means of "stimulating children to think as they read and to think about what they read". Questions are considered, by many scholars, to be the most commonly accepted tool for developing students' comprehension ability (Ruddell, 1974; Baker, 1980; Daines, 1982).

Since questions comprise such a major part of the methodology used in teaching reading comprehension, it follows that an investigation of questioning techniques and strategies should serve to not only enlarge the present knowledge base about reading instruction but also to allow for more effective use of questions as an instructional tool. This leads to a consideration of the chain of facts, research findings, and conditions which have provided the background for the present study.

1.1 Background

Effectiveness in teaching reading comprehension is an issue of concern for both researchers and teachers. Classroom observations (Durkin, 1979) and studies of instructional materials (Durkin, 1981; Allcock, 1972; Davidson, 1972; Jenkins and Pany, 1978) have indicated that much of the comprehension instruction is composed of practice and assessment.

Basal reading programs have been and continue to be the most commonly used instructional material in the elementary school curriculum in Canada (Baker, 1980). Research has tended to indicate that the content of instructional materials bears a strong influence on classroom practice (Staiger, 1958; Austin and Morrison, 1963, Chall, 1967; Cowart, 1970; Rosecky, 1977; and Durkin, 1981). As a result of this research, on the interaction between instructional

materials and classroom practice, educators have stated that the most efficient means of bringing about a change in teacher practices is to incorporate the change into curriculum materials (Cronbach, 1955; Clement, 1942; Richek, 1979). Popham (1969) has reinforced this notion by stating that "The enormous impact of curricular materials as change agents should not be underestimated, and a consideration of research relevant to curriculum materials is clearly in order"(p. 319).

Studies have indicated, however, a lack of instructional effectiveness in developing reading comprehension (Durkin, 1979; Renzulli, 1979: Tatham, 1979). This raises the question of whether or not the same lack of instruction is reflected in the instructional materials used by teachers. Since a predominant part of comprehension methodology is composed of questions, this tool has been the prime target for analyzing comprehension instruction in reading programs. Findings of these investigations have indicated that questions presented in teacher manuals are similiar in that the majority require a literal level of comprehension (Bartolome, 1968; Marksberry, McCarter and Noyce, 1969; Mueller, 1972; Nicholson, 1977; Hatcher, 1971; Cooke, 1970 and Rosecky, 1977).

The research literature contains information ranging from descriptions of good questions (Hook, 1950; Gillett and Temple, 1982; Taba et. al., 1964) through outlines of effective question sequences (Taba, 1967; Ruddell, 1978; and

Daines, 1982) to a comparative questioning procedure for teaching reading as concept development (Henry, 1974). It is clearly evident that writers and researchers are concerned about utilizing clear strategies for developing comprehension. Embracing the philosophy that reading comprehension needs to be taught, questions should be expected to accomplish something by serving as a means of teaching students how to think and in furthering their conceptual development.

Previous research has highlighted two issues which have influenced the direction of the present study: (1) less effective procedures are being used for comprehension development and (2) instructional materials may be a productive medium for instituting changes in classroom practices. It follows then that comprehension procedures might be improved if research information on questioning strategies were incorporated into the methodology presented to teachers in teacher's manuals.

Much of the previous research on comprehension practices and materials has been conducted within an American context. The primary focus of many of these studies has been on classifying questions and activities according to taxonomies of comprehension skills (eg. Sanders, 1966; Barrett, 1968). Further research should indicate not only the nature of comprehension questions, but also the types of strategies used in organizing and sequencing them. It seems important that the focus of such a study should not only

specify what is contained in manuals but by drawing on available literature, should outline possible strategies which might strengthen the questioning techniques being suggested for developing comprehension.

1.2 Purpose

The major purpose of this study was to analyze and compare the comprehension questions contained in manuals of two Canadian basal reading programs by:

(1) determining the complexity of thought processes required by the questions

(2) detecting what organizational strategies were utilized for developing comprehension.

1.3 Definition of Terms

The terms evolved for the Question Categorization System are described in Chapter Three. The following definition of reading comprehension is used in this study:

> "...comprehension represents an interaction between the reader and the text. The reader brings to the text knowledge of the world, the text provides information. The reader then can add knowlege to the text and, through processes of reasoning, arrive at products of thought, such as interpretations, generalizations and evaluations that go beyond those that are made in the text (Singer, 1980, p. 512).

1.4 Research Questions

The following research questions guided the analyses of the Canadian reading programs which constituted the data for the study:

1. What kind of thinking processes are required by the reading comprehension questions suggested in basal teacher manuals, at the grade five level?
2. To what extent are comprehension questions organized into purposeful sequences for developing students' comprehension skills and concepts?
3. To what extent do the questions develop rather than assess comprehension skills and concepts?
4. How are the reading programs alike or different in the information provided for developing comprehension?

These research questions were all directed toward the comprehension questions in manuals of two reading programs at the grade five level.

1.5 Methodology

In the first stage of the research, all stories and poems in the Ginn and Nelson, grade five programs were grouped according to seven genre types: (11) Traditional Tales of a Culture, (2) Fantasy, (3) Historical Fiction, (4) Contemporary Fiction, (5) Information, (6) Poetry, and (7) Drama (Huus, 1981). Fifty-six stories and poems were selected for the research sample. Corresponding

comprehension questions from the teacher manuals for before, during, or after the reading of the selection, were considered as data for the study. Questions were marked as either text dependent, that is not answerable without knowledge of the written information in the text, or text independent, that is being answerable without information from the text.

The Question Categorization System, was developed by the researcher for analyzing the nature of the comprehension questions. Text dependent questions were categorized in five mutually exclusive classes. These categories reflect the range of information sources a reader may draw from as well as the cognitive operations one might engage in when answering a question.

Text independent questions were labelled according to four possible purposes: (1) focussing attention, (2) setting a purpose for reading, (3) providing background, or (4) developing vocabulary. These questions were expected to occur prior to reading, although some vocabulary development questions might be positioned during the reading.

The second stage of the research involved an examination of the questions to determine the presence and extent of organized question sequences.

A question sequence was considered to exist when a succeeding question was related to, dependent on, and developed information from the preceding question. Sequences were distinguished from groupings in that a question

grouping was defined as a series of topic-related questions which do not depend on or extend the thought of a previous question.

All questions were re-analyzed for question sequences as well as question groupings. This data was gathered and the corresponding question category that had been assigned in Stage One was recorded. Sequences of questions were classified according to the Taba model and were labelled as either focus, extend, or lift (Taba, 1965). Results were summarized to reflect the concentration of sequenced and grouped questions in relation to the total questions in the sample, as well as in relation to category types.

1.6 Assumptions

A major assumption, underlying this study, is that instructional materials do influence students' academic development (Austin and Morrison, 1963; Chall, 1967; Cowart, 1970; and Rosecky, 1977). They serve a function of guiding teacher practices and so what is presented in teacher manuals does make a difference in terms of the instruction children receive.

A second assumption is that questions are meant to evoke a type of mental interaction with a data base, therefore requiring the use of certain thinking processes. Since concrete proof of mental interaction and specific thinking processes may not be tangibly examined, one must

concede that these internal responses to questions may differ from child to child. The essential issue in this assumption, however, is that questions do have the potential for evoking certain types of interaction, requiring selection and organization of information by the student.

Thirdly, this study is based on the assumption that sequenced questions are an effective means of developing and extending student thought. Purposeful sequences and organized questioning strategies, in teacher manuals, should strengthen instructional practices, thereby assisting in student's comprehension development.

1.7 Delimitations of the Study

The present research was purposefully limited by the following factors.

1. In order to reduce the sample to a manageable size, questions were drawn from teacher manuals only. It is realized that findings from the study may not be representative of the questions in the other instructional materials of the Ginn and Nelson reading programs.
2. The sample was drawn from manuals for one grade level only, grade five, and thus findings may only be generalized to the comprehension questions suggested for this particular level.
3. Only two basal reading manuals were used as data sources

for the study. The results may not be generalizable to comprehension methodology in other basal programs.

1.8 Significance

Several factors appear to contribute to the significance of this study:

1. Little research has been conducted on the nature of questions provided in Canadian basal programs. In light of the widespread use of basal program manuals, it seems essential that teachers and publishers should be aware of instructional applications derived from specific aspects of the content.
2. The Question Categorization System, which was developed for analyzing comprehension questions in the present study, may be of value to educators for constructing and analyzing questions used in their instructional materials.
3. The findings from the literature review and from the present study may provide useful information upon which to base changes in questioning techniques used in classrooms,as well as in the reading programs.

1.9 Overview

The remainder of this thesis is divided into four chapters. Chapter Two is organized into two sections, one providing a rationale, along with a theoretical framework for the present investigation of of the comprehension questions in basal manuals and the second section reviewing the literature related to the relationship between questioning strategies and comprehension development. Chapter Three is a presentation of the design, sample, analysis instrument, procedure, and analysis stages. Chapter Four is a report and discussion of the findings related to the six research questions. Chapter Five provides a summary of the study, conclusions, implications for questioning strategies used in comprehension development, and suggestions for further research.

2. REVIEW OF RELATED LITERATURE

The purpose of this review of the literature is first to provide a rationale along with a theoretical framework for investigating comprehension questions in the manuals of basal reading series. A second purpose is to develop a perspective from which to analyze questioning strategies through reviewing previous studies of relevance to this topic. The literature review is composed of two main sections, reflecting the two-fold purpose of the chapter.

2.1 Reading Comprehension and Cognitive Development

The definition of reading comprehension which forms the framework of the present study on questioning strategies (p. 5) emphasizes the reader as actively utilizing his/her cognitive processes to interact with the author in bringing meaning to the print and in deriving meaning from the print.

The idea of reading comprehension being dependent on the development of one's thought processes is not new. Huey (1916) emphasized the cognitive nature of the reading process by describing it as a mirror image of the psychological processes used in thinking. He pointed out that reading instruction should facilitate meaning acquisition for the curious and questioning child.

Working from a similar viewpoint, Thorndike (1917) considered reading comprehension to be a thought process which involved the "organization and analytic action of

ideas". By this he meant that the reader must evaluate ideas, retaining some and discarding others in order to fit the unknown to the known, thus making sense of written symbols. Thorndike emphasized the notion that students should be taught to be active, reflective thinkers if they were to become competent readers.

The notion of reading as a developmental cognitive process was expanded on by Stauffer (1969). He described reading as a reasoning, problem-solving activity, with concept development being an important prerequisite to reading comprehension. Drawing from the work of Russell, Guilford, Piaget, Bruner, and others, Stauffer presented his view of the reader as an active information seeker who examines information, generates hypotheses and forms conclusions and generalizations.

Jenkinson (1973) carried these ideas further by describing reading as a form of thinking in which the reader uses such mental processes as analyzing, discriminating, judging, evaluating, and synthesizing to scrutinize the text content in light of his/her own experiences.

Reading and thinking have been considered synonymous (Gantt, 1970) on the basis that both are an interactive process between an individual and the environment. Gantt postulated that the reader needs an adequate knowledge base from which to extend his/her experiences thus engaging in a communicative process with the author.

In agreement with this viewpoint, Elkind (1976) related reading and thinking by stating that the "reader gives meaning to the words he reads by relating these to the conceptual system he has constructed in the course of his development" (p. 337). Comprehension, therefore is dependent on two factors: (1) the quality of the reading material and (2) the breadth and depth of the reader's conceptual understanding.

Henry (1974) related reading comprehension to thinking by describing reading as being embedded in two modes of thinking: analysis and/or synthesis. He stated that there are basic strategies within either thinking process which remain the same but are constantly refined over time, as a result of use.

In elaborating his theory of reading as concept development, Henry defined reading as the discovery of relations and the invention of a structure of these relations. This act of structuring occurs as a result of the intertwining of four logical operations: the act of joining, excluding, selecting and implying. These operations or strategies may assume such names as uniting, separating, omitting, and predicting and are woven together within any logical process (e.g. comparison, evaluation, validation). The purpose of the logical process is what determines the organization of the logical operations. This organization is what leads to a structure of relations. The structure which emerges is the concept and therefore, reading as concept

development is aimed at the invention of a set of relations.

In the Henry model, thinking is seen as the interplay of the operations of joining, excluding, selecting, and implying. Henry asserted that the instantaneous intertwining of these operations occurs continuously when reading and if this activity did not occur there would be no reading. He suggested that these operations are constantly being refined over the years and that schools should provide instruction that would allow for a "a year-by-year refinement and developmental mastery of basic logical processes" (Henry, 1974, p. 4).

2.2 Influence of Teacher Questions on Student Performance

In general, the research literature had indicated that the nature of teacher questions has a definite influence on the type of thinking that students engage in. Children were able to function at higher levels of comprehension when asked questions that varied in cognitive levels and which were sequenced to allow for transition from one level of thought to another (Taba and Elzey, 1964). Results from further study (Taba, 1965) on the effects of questioning indicated that a slight increase in higher thinking questions resulted in more divergent and evaluative responses being given by a greater number of students.

Classroom interaction studies by Gallagher and Aschner (1963) also have indicated a relationship between teacher

questions and student responses. These researchers found that an increased use of higher level questions by teachers resulted in higher thinking by students as well as an increased number of students responding to the same question.

In classifying the verbal behavior of teachers, Wolf, Huck, and King (1967) found that questions categorized as interpreting, analyzing, applying, and evaluating, produced higher level responses than did specific fact or classifying questions. This study was directed at investigating the critical reading ability of elementary students through using a modification of Bloom's taxonomy to analyze the relationship between teacher questions and student responses.

An examination of the interaction that occurred during the development of students' reading comprehension revealed that student responses were congruent with literal level questions posed by teachers (Guszak, 1967). The researcher observed that students seemed to know what their teachers wanted and had learned to adapt their way of reading to the types of questions they anticipated receiving.

Smith's (1979) research established a link between the cognitive level of teacher questions and the length of communication units in corresponding student answers. She found that both elementary and secondary students averaged a higher number of words when answering higher cognitive level questions as compared to the number of words used when

answering lower cognitive questions.

2.3 Role of Questions in Cognitive Development and Comprehension Instruction

Piaget (1970a) and his associates at the Geneva School of Thought have been studying the nature of children's thinking and learning for over fifty years. These studies have revealed a developmental sequence in thought which is differentiated into four main stages, each corresponding to particular mental ages, accumulatively increasing in abstractness and complexity of cognitive structures. Cognitive growth is a maturational process, that is hierarchical in it's organization (Inhelder, 1962). An individual's cognitive structure is continually changing as a result of the accommodation and assimilation that occurs through one's encounters with the environment. These mental processes of assimilation and accommodation are considered operative at any level of thought, at any age level, and with any content.

Learning experiences occur as a result of interactions between maturational and environmental variables. However, the extent of these learning experiences is limited by the "general constraints of the current developmental stage" (Piaget, 1970a, p. 713). Piaget considers a student's learning experiences to be "only a sector or a phase of development itself, arbitrarily provided by the environment"

(Piaget, 1970a, p. 713). Piagetian theory embraces the notion that thinking processes may be developed by training, however the age-bound developmental stages create the pre-requisites for benefiting from these learning experiences.

Piaget's cognitive development theory is descriptive rather than prescriptive in its implications for comprehension instruction. Phillips (1969) defines teaching as "the manipulation of the student's environment in such a way that his activities will contribute to his development" (p. 108). A primary notion of Piagetian theory is that a child learns through involvement in and manipulation of the environment (Stallings, 1977). Essentially then, the child must be actively interacting with his environment. Furth (1970), in describing the implications of Piagetian theory for teachers, states that Piaget considers deveolpment to occur in any environment and intelligence to grow from within, therefore, "the task becomes one of furthering and nourishing the growth by providing suitable opportunities, not by implicit teaching of what to do or what to know" (p. 74).

In summary, some of the basic premises of Piagetian theory that relate to cognitive development are: (1) thinking develops when there is an active transaction between the individual and the environment; (2) thought development follows a sequence wherein the simpler and more concrete develops first, preparing the way for the more

complex and abstract; and (3) assimilation and accommodation of new learning requires a constant reorganization of previously learned information and skills.

Several elements of Piaget's research relate to the present study on questioning strategies. First, since teacher questions serve as an environmental factor determining what and how children may cognitively examine issues, they also exercise a directing influence over students' comprehension development. Second, Piaget's mapped-out sequence of thought development provides a rationale for the notion of question sequencing in teaching reading comprehension. Third, the effective use of teacher posed questions enable students to become active participants in the learning process.

Russell (1956) has provided a descriptive account of thinking in which he portrayed it as a sequence of ideas which move from some initiation, through some pattern of relationships, to some goal or conclusion. He considered children's thinking to vary and to be determined not only by the nature of the problem, but by personal and environmental factors as well. A personal factor would be the maturity of the person doing the thinking and an environmental factor, the amount of direction involved in the thinking process.

Russell classified thinking into six types, which are dependent on the amount of direction present in the thinking. Moving from relatively nondirected to relatively directed thinking these are described as perceptual

thinking, associative thinking, inductive-deductive thinking leading to concept formation, problem solving, critical thinking, and creative thinking. One type differs from another according to the degree of complexity of the relationships within each, perceptual being the most simple and creative the most complex.

All six types of thinking follow similar steps or sequences. Russell outlined these steps in the following ways:

1. the environment stimulates thinking
2. the thinking takes its initial direction
3. there is some search for related materials
4. these materials are organized into tentative patterns or hypotheses
5. the goals are examined critically
6. some tentative conclusion or goal is reached which may eventuate in overt action. (Russell, 1956, p. 28)

Several components of Russell's theory regarding children's thinking have affected the direction of the present study. First, the differentiation of types of thinking according to the amount of direction involved has implications for the importance of comprehension questions, not only in directing but also in determining the type of thinking that students might engage in. Second, Russell's outline of the sequential steps involved in thinking provide not only a guide for what might be present in a questioning sequence but also reinforce the notion that just as there is

a purpose, direction and outcome in thinking sequences, so there should be in the questions used for developing comprehension.

Peel (1960, p. 16) has classified thinking by "content and results rather than by processes". He identified four types of thinking in children or adults: (1) thematic, (2) explanatory, (3) productive, and (4) integrative. Peel organized these types of thinking in a progression from simple to complex, with thematic thinking being the most simple and integrative the most complex, only being present in the most capable students.

Peel (1960) stated that thought content is dependent on the association or relation finding that an individual makes between component parts. Students may demonstrate thinking in all four levels, however, differ in the quality and complexity of the associations established within each level. Peel has credited Piagetian research and theory but qualified his own theoretical orientation by stating that sequential development does not occur through invariant stages since thinking will vary according to the content of the field as well as according to the intellectual ability of the child. These factors result in an overlap in development between individuals, as well as an absence of consistency in an individual's level of thinking within different fields of study.

Peel's primary influence on the present study has been in regard to his discussion of overlapping levels of

thinking which result from differing bodies of knowledge that individual's have for various fields of study. The notion that the extent of one's knowledge base determines the complexity of one's thinking is an issue which needs consideration when using questions to develop student's comprehension. Questions will only be effective for promoting cognitive growth, up to the point that the child's prior knowledge and experiences have been sufficiently expanded to deal with the information that is being received.

Differing somewhat from Piagetian theory, Klausmeier (1979) and his associates developed a theory of conceptual learning and development (CLD) based on levels of concept attainment rather than stages of cognitive growth. The four levels of concepts (concrete, identity, classificatory, and formal) are sequentially arranged in order of complexity of thought. Although children must invariantly progress through these levels, individual concepts develop at different rates and may co-exist at different levels within one child.

Cognitive development is stimulated by the interaction of learning, maturation and environmental conditions. The level of concept master may be attributed to three factors; (1) prior experiences of the learner, (2) instructional conditions under which the concept is learned, and (3) the type of concept being developed (Frayer, Ghatala, and Klausmeier, 1972).

"Guidance" has a direct effect on students' cognitive development (Klausmeier, 1979). In CLD theory, the quality as well as the amount of schooling plays a significant role in determining "when and also whether the highest level operations, such as inferring will be performed on some kinds of symbolic content" (Klausmeier, 1979, p. 5,6). Klausmeier emphasizes the primary influence of instruction in determining cognitive growth. This is an opposite viewpoint from Piaget's premise that learning experiences are circumscribed by an individual's current stage of cognitive development (Brainerd, 1979).

The emphasis that Klausmeier places on the role of instruction in determining the extent and quality of students' cognitive growth has important implications for the present investigation into the use of questions for developing reading comprehension. Research indicates that questions have been used as the main instructional tool for developing students' thinking as they read. This emphasis reinforces the importance of investigating the nature of questions provided in teacher manuals.

2.4 Summary

Much of the current reading research has been based on the viewpoint that the reading process is "inextricably embedded in the thinking process" (Henry, 1974, p. 5). Reading comprehension development is therefore dependent on

the development and exercise of an individual's cognitive processes. Studies indicate that questions are instrumental in fashioning students' thought patterns since the type of thinking students engage in is often determined by the type of question teachers ask.

Several common elements of cognitive development theories have formed a rationale for the present study.

1. Thinking development is influenced by experience, intelligence, and environmental factors.
2. Thinking development follows a sequence which ranges from the simple to the complex.
3. Thinking may be trained and needs to be developed.
4. The complexity of thinking is determined by one's extent of knowledge in a particular field.

These common elements provide implications for the use of questions in developing students' reading comprehension . First, questions may be a prime "environmental influence" for stimulating cognitive growth and comprehension development. Second, questions should do more than influence, they should direct and train students to think in a variety of ways. Third, if questions are to train students to think and thus to enlarge their comprehension, then questions should be ordered to some purpose. Finally, since questions exert such a primary influence over the development of thinking, teachers need to be aware of how to formulate and organize comprehension questions into meaningful sequences which would develop students' abilities

to think as they read.

The second section of this chapter is a brief overview of some of the literature that was investigated regarding the nature and classification of questions. Some aspects of the classification schemes discussed, were incorporated into the Question Categorization System developed by the researcher for this study.

2.5 Classification of Questions

Researchers have demonstrated a concern for investigating the levels and function of questions in the teaching-learning process. The chart in Table 2.1 represents a range of approaches which researchers have taken to link hierarchies of questions with levels of cognitive processing. Reading researchers have developed systems based on some of this cognitive research, for explaining reading comprehension development. Barrett (1968) and Ruddell (1974), in attempting to associate cognition with levels of comprehension, devised categorization systems which have been used for analyzing comprehension questions.

The contributions of Roger Cunningham (1971) and Pearson and Johnson (1978) provided the most direct influence on the present study. For that reason, a discussion of the work of each reasearcher is presented.

Table 2.1

Systems for Categorizing Levels of Questions According to Levels of Cognition [a]

Minor (1966)	Fraenkel (1966)	Clements (1966)	Douglass (1967)	Guilford (1956)	Gallagher (1964)	Bloom (1956)	Sanders (1966)	Crump (1970)
Synthetic questions	"Who", "when" "what" questions.	Questions with one acceptable answer.	Problems of retrieval.	Recognition Recall	Cognitive memory.	Knowledge	Memory	Reproduction
		Questions with many acceptable answers.	Problems in reasoning.	Convergent thinking.	Convergent thinking.	Comprehension	Translation	Translation
Real questions	"Why" questions. "What if" questions.	Questions with no answers.	Problems to be discovered.	Divergent thinking. Evaluative thinking.	Divergent thinking. Evaluative thinking.	Application Analysis Synthesis Evaluation	Application Analysis Synthesis Evaluation	Reflection Valuation

[a] For a description of the categories, the reader is referred to the original sources in the Reference list.

Cunningham (1971) adapted Amidon and Hunter's (1967) description of narrow questions and broad questions to group four possible categories of questions. These four question categories: cognitive-memory questions, convergent questions, divergent questions, and evaluative questions, were derived from Gallagher's (1965) classification, which received its inspiration from Guilford's (1956) model of the intellect. Cunningham's (1971) system is summarized below.

1. Cognitive-memory questions are narrow and limited to the lowest level of thinking. The answers are a reproduction of facts, definitions, or other remembered information. The student may respond with a one-word answer or give the name of something.

2. Convergent questions, are broader than cognitive-memory questions because the student must put facts together to construct an answer. They are narrow questions in the sense that there is one "best" or "right" answer. The student may explain, state relationships, associate and relate, or compare and contrast information.

3. Divergent questions are broader than the preceding questions in that they allow for more than one acceptable answer. The question requires the student to organize elements into new patterns which were not clearly recognizable before. The student may predict, hypothesize, infer or reconstruct information.

4. Evaluative questions involve cognitive operations from all three of the other levels and the response may be broad

or narrow. The student must organize his knowledge, use evidence to form an opinion, and take a self-selected position. He/she forms a judgment of good or bad, right or wrong, according to standards set personally or by someone else.

Pearson and Johnson (1978) devote considerable attention to suggesting appropriate questions for use as comprehension probes. The writers have developed a unique three part category scheme for analyzing comprehension questions. The scheme is aimed at capturing the relationship between information presented in a text and information that has to come from the reader's store of prior knowledge. The three types of question-answer relations are: textually explicit, textually implicit, and scriptally implicit.

Textually explicit questions require obvious answers that are contained on the page. Both question and answer are derived from the text and the relation between question and answer is explicitly cued by the language of the text.

Textually implicit questions go beyond these factual recall questions in that the answers are on the page, but are not so obvious. The question and the response are derived from the text but the reader must take at least one step of logical inferring in order to get from the answer to the response. There is no logical or grammatical cue tying the question to the answer and the answer is plausible in light of the question.

Scriptally implicit questions require the reader to use his script or his own experience in order to come up with the answer. Pearson and Johnson adopted the term "script" from Schank's (1973) use of the word in referring to the standardized, stereotyped frameworks of information which are fed into computer programs that are designed to answer questions. Schank developed scripts such as a restaurant script, a bus ride script, or a subway script which could be fed into the computer and then called up when the computer encountered a story dealing with going to a restaurant, riding a bus, and so on. Pearson and Johnson considered the term "script" to provide a useful metaphor of how students, as living information processors, use generalizations from their own experience to answer questions. Comprehension would be labelled as scriptally implicit whenever a plausible nontextual response is given to a question that may be derived from the text. Responses to these questions may also be referred to as reading "beyond the lines".

2.6 Questioning Strategies

Taba has contributed extensively to the information available on questioning strategies and techniques. Questioning strategies are considered important for assessing and developing relevant concepts as well as for providing a framework for the child's "search for the structure of the problem" and identification of

"relationships and patterns among ideas and facts" (Taba and Elzey, 1964). Taba and Elkins (1966) noted that the control of a discussion sequence is important for structuring the development of ideas so that there is a cumulative heightening of perception and insight.

Three possible types of discussions (free, semi-controlled, and controlled), have been suggested by Taba (1967) for use as teaching strategies. A controlled discussion is a strategy in which "the cognitive processes are directed by carefully planned sequences of questions" (Taba, 1967, p. 78). In this situation students are required to process data as well as supply it. The goal of a controlled discussion is to advance students to higher levels of thinking and the key feature of these sessions is the teacher's question (p. 88). Taba's controlled discussion concept is discussed in this section on the use of questioning strategies for comprehension development.

Controlled discussions involve a three part strategy for systematically sequencing questions. Variations in the nature and placement of questions allow them to perform the functions of focussing, extending, and lifting students' thought. Focus questions initiate a discussion, specify the cognitive process, and delimit the topic on which the process is to be performed. Extention questions keep the discussion at the same level in order to obtain more information or data. Lift questions raise the level of the discussion to cause students to think at a higher level.

These questions may elicit additional information or may require students to abstract common elements from several examples. Taba (1967) stated that focussing, extending, and lifting questions develop three cognitive tasks: Concept Formation, Interpretation of Data, and Applications of Principles.

Along these same lines, Hunkins (1972) presented the idea that questions do not exist in isolation but within a scheme which may serve four possible functions - centering, expansion, distribution, and ordering. Hunkins used the Bloom-Sanders taxonomy to demonstrate that all teacher questions may be classified within all levels of the Taxonomy as well as in a particular sequence. He pointed out that questions may be posed at each level of the Taxonomy, and in answering these questions, students progress through levels, ultimately engaging in increasingly higher patterns of thinking. The function of centering and expansion questions is to assist students to focus on material at a particular cognitive level, engage in divergent thinking, and then raise their investigation or reaction to another cognitive level.

Several reading researchers have incorporated Taba's notion of focus, extend, and lift questions into a strategy for developing comprehension abilities. Ruddell (1978, p. 114, 115) described seven questioning strategies, the following four being the ones he considers most significant for use in comprehension instruction.

1. Focussing - enables the teacher to establish a mental set or purpose for reading.

2. Extending - the teacher elicits additonal information on the same subject at the same comprehension level.

3. Clarifying - the teacher encourages the reader to return to a previous response for futher clarification, explanation or redefinition.

4. Raising - teacher obtains additional information on the same subject but at a higher level of comprehension.

Daines (1982) developed a Four-Step Question System which is essentially derived from Taba's strategies for questioning. She described this as a four-step sequence which "uses an inductive process of interpreting data". This model, aimed at enabling students to clarify and extend their comprehension of ideas, may be used in every subject and at any grade level. A summary of Daines' (1982, p. 161-163) explanation of question categories and selected examples are provided.

1. Open questions are the first step to elicit specific relevant facts that may create a base for responding to higher cognitive level questions.

e.g. "How did the people secure their food?"

2. Focussing questions center students' thinking on the specific facts or ideas considered to be significant. Both the process and the topic should be specified in the question.

e.g. "Let's list all the fruit that grows in this

valley."

Fruit grown in a local valley is established as the topic and the process is enumeration from recall.

3. Interpretive questions ask students to explain the relationships the teacher considers to be important to their understanding of facts, issues, and events. When interpreting data, the student explains and elaborates on information sought in the first and second steps.

e.g. "How do you account for the differences between Ben and Josh?"

"In what ways did Ben emulate his father?"

"In what ways are the two compounds similar?"

Daines stated that when students wander from the subject or focus, the teacher should restate or refocus on the original relationship question. The questions should serve to broaden students' patterns of thinking.

4. Capstone questions provide the concluding step in the strategy, moving the discussion to a verbalization of an abstraction. Such questions complete the sequence by calling for a conclusion, prediction, evaluation, or generalization.

e.g. "What would you predict happened to Josh as a result of these incidents?"

"Evaluate the story by using this set of criteria."

"What conclusions might you draw from these findings?"

George Henry (1974), a prominent theorist in the field of reading, has utilized questioning strategies in his method of developing students' reading comprehension. He

prescribed the use of questions in a comparative method of relating one work to another on the basis of similar themes, characters, conditions, or author's style and point of view. Henry stated that teachers can not teach thinking solely by making pupils think. Questions need to be carefully sequenced according to some logical form so that they might evoke a spontaneous discussion of the reading that would serve to hold the pupil's thoughts together and would provide some structural format for them to approach other works. Questioning strategies are involved in all that Henry considers to be part of conscious conceptualization: discovering relations, inventing structure, making comparisons, resolving conflicting ideas, evaluating, and creating categories.

A questioning strategy based on the Henry model would embody a series of questions requiring the student to join, exclude, select, or imply from the information read. The goal of such a strategy is to relate works into a lattice or pattern through comparing one with another, for the purpose of extending students' comprehension.

2.7 Characteristics of Good Questions

Researchers have provided a rather composite picture of the nature and purpose of good questions. Almy (1966) stated that questions should give some insight into the nature of children's concepts and should not require a single correct

answer. Hoskisson (1973) noted that comprehension questions should foster reflective thinking.

In 1950, Hook discussed the use of questions in teaching "straight thinking" to high school English students. The suggestions that he made apply to the elementary reading teacher. Aimless discussion should be avoided, along with questions which generate either-or thinking or hasty generalizations. Teachers should discourage emotional reactions, resulting in such stereotypes as "the biggest school is best" or "a bestseller must be a good book".

The need for questions to be open ended, yet focussed was an issue that Taba (Taba, Levine, and Elzey,1964) stressed in her writing. She qualified this notion by stating that the focus of the question should allow for a variety of responses. Questions should create transitions in thought by causing the student to move from the specific to the general, from descriptive thinking to explanatory, or from formulating generalizations to applying them in new contexts. Taba considered it essential for questions to be organized into sequences which stimulate and quide the thinking of the student.

The importance of questions purposefully developing and broadening students' concepts was highlighted in a statement by Pearson and Johnson (1978). They considered detail questions important, only if they could be "used to help students identify facts that broaden generalizations" (p.

90). These reading researchers think that comprehension should be taught directly and teacher questions should serve to point out, penetrate, and give direction.

The notion of questions facilitating higher order abstractions, concepts and generalizations was also discussed by Hunkins (1972). He viewed the thinking process as a sequential one and therefore questions should be arranged in a sequence or strategy that would guide pupil's thinking from a low cognitive level of recall through to higher cognitive levels of analytical and evaluative thinking.

Reading professionals, Gillett and Temple (1982, p. 90), suggested that comprehension questions should be able to be answered or inferred from the selected passage. They should require interpretation and judgement, as well as literal comprehension. The wording of questions should be simple and they should call for an understanding of the most important events or concepts in the passage. Questions requiring one-word answers or yes-no and either-or responses should be avoided.

2.8 Studies on Questions Used in Classroom Interaction and Instructional Materials

Previous research has indicated that textbook questions as well as teacher questions in the classroom emphasize knowledge of facts and do not stress higher cognitive levels

for developing pupils' thinking (Hunkins, 1966; Moyer, 1966, and Davis and Hunkins, 1966).

Research into teacher's use of questions during reading lessons indicated that 70 percent of teacher questions were at a factual or literal level, dealing mostly with the "factual makeup of stories" (Guszak, 1967). Guszak observed that many of these questions required a student to recall minute, trivial facts which might in fact cause the student to even miss the literal meaning of the broad text. Evaluative questions were the next most commonly used, many requiring only a yes or no response. Inferential questions of cognition and explanation combined, were third in order of frequency. Guszak observed that students seemed to know what was expected of them by their teachers and factual responses were given to 90 percent of the factual questions on their first attempt.

Several conclusions were drawn from this study. First, Guszak considered there to be an excessive emphasis being placed on literal questions, regardless of the nature of the materials or the ability of the readers. Second, he supposed that inferential and evaluative questions were used to a lesser extent because teachers did not have a clear conceptualization of reading comprehension upon which to base their instruction.

One powerful question emerging from this research is, if teachers ask 70 percent of their questions at a factual level, are they being led into this by the nature of the

questions supplied in teacher's manuals? Guszak's research points out the need for teachers to be knowledgeable of questioning techniques, not only for lifting and expanding students' thinking but also for evaluating the aid provided by reading programs for developing comprehension.

Researchers have attempted to address this concern, by investigating the nature of questions used in instructional materials. Through comparing the questions and objectives listed in basal reader guidebooks with those that occur in a reading lesson, Bartolome (1968) found that the objectives and questions were often at the literal level involving memory.

Similar results occurred in an extensive study of the relation between cognitive objectives contained in educational literature and the levels of cognition demanded by the questions in teacher's editions for various subjects (Marksberry, McCarker and Boyce, 1969). Using Bloom's taxonomy as the system for analysis the researchers' found that questions in the reading series were of a low level, with essentially no questions in the synthesis category and few in the evaluation category.

An examination of cognitive objectives and comprehension methodology, carried out by Vaughn (1976), yielded rather differing results than those of previous studies. Vaughn used Guszak's taxonomy to compare cognitive objectives given by the authors with comprehension questions, the primary methodology used for teaching

comprehension. Conclusions from this study were: (1) questions tended to fulfill the stated cognitive objectives; (2) questions in grades four to six required higher level cognitive operations than in grade one to three; (3) questions were predominantly at the literal level of comprehension, although there was a higher percentage of questions at the inferential level than had previously been indicated in the literature.

Muellers's (1972) research on teacher questioning practices generated information in agreement with the findings of other researchers. She analyzed the levels of thinking fostered by the teacher's guide of basal programs as well as the amount of congruence that existed between the text and teacher's verbal behavior. Using the Aschner-Gallagher category system to analyze 850 questions drawn from the teacher guides of two basal programs, Mueller found that most of the questions in both texts were of the closed type, requiring a specific answer. Nearly two thirds of the questions in the text for below average readers were at a cognitive level, requiring the student to produce remembered content or to read verbatim from the text. More than half of the questions for average readers were convergent, requiring the student to process the data toward the production of a specific response.

Several researchers, utilizing Barrett's Taxonomy as an analysis instrument, arrived at common conclusions from their investigation on the level of comprehension required

by the questions in teacher's manuals of basal readers (Nicholson, 1977; Hatcher, 1971; Cooke, 1970). The largest percentage of questions were worded to elicit a literal level of comprehension.

Rosecky's (1977) conclusion that a sample of questions and activities from teacher's guidebooks emphasize a literal comprehension of details, is consistent with what has been found by other researchers. Rosecky, in determining teacher use of guidebooks, analyzed questions and activities drawn mainly from the Directed Reading section of the teacher's manual. Findings from the study led him to state that textbooks and instructional materials do affect classroom practice. Rosecky recommended that publishers should incorporate more ideas from the research on learning strategies.

All of the previously described research have been conducted on American instructional materials. Baker's (1980) thesis was the only research on Canadian materials that was located. She traced the evolution of reading comprehension methodology, in elementary reading series, used in Canada between 1925 and 1978. Part of her analysis involved the categorization of all comprehension methodology used in manuals and workbooks, according to Barrett's Taxonomy. An analysis of some reading series that are currently being used, indicated that for two of the series, most methodology was at a literal and inferential level, while the third series contained more methodology at the

literal level.

Part of the methodology analyzed were questions from manuals and workbooks in the Ginn Starting Points in Reading series and in the Nelson Language Development series. Baker found that the highest percentage of questions in the Ginn series, at the grade five level, were inferential (37.7%), followed closely by those of a literal nature (35.4%). The Nelson series, at the same level, had most questions at the inferential level (37.3%), followed by 26.7 percent at the appreciation level and 18.7 percent at the literal level.

Baker's findings on levels of questions in the Ginn and Nelson series have led the way for the present research. Since research has shown that published materials do influence classroom practice, it seems that further research on Canadian basal reading programs is necessary. The present study is aimed at not only analyzing the nature of comprehension questions, but also at investigating the questioning strategies presented in teacher manuals for comprehension development.

2.9 Summary

The survey of literature has indicated the important role of questions in developing students' cognitive abilities and enlarging their reading comprehension. Variation in the nature of questions has been clearly outlined by the myriad of classification systems which

exist. Elements from two categorization schemes, developed by Cunningham (1971) and Pearson and Johnson (1978) have been incorporated into the Question Categorization System devised for use in the present study.

Researchers are concerned with the need to organize questions purposefully to develop students' thinking. Many questioning strategies have been derived from a Taba system, which in fact provides the theoretical framework for the present analysis of questions, drawn from Ginn and Nelson basal manuals.

General consensus in the literature regarding the characteristics of teacher questions is that they <u>should</u>:

1. be focussed, yet open-ended
2. be sequenced to create transitions in levels of thought
3. require a variety of thinking processes
4. develop and broaden students concepts
5. be worded simply, directed at essential items

Questions <u>should not</u> encourage:

1. one word, yes/no, either/or responses.
2. hasty generalizations
3. stereotypic answers

Research regarding the nature of questions used in classroom interaction and materials indicated that most questions in reading manuals as well as those used in actual teaching situations have been at a literal level of comprehension. Recent studies by Vaughn (1976) and Baker (1980) provide evidence that this trend may be shifting,

with publishers beginning to devise higher level questions and activities for developing students' reading comprehension.

The relevant information from studies described in this chapter was used to classify and categorize the questions in the selected series and this is described in the next chapter.

3. DESIGN OF THE STUDY

3.1 Introduction

This chapter presents the design of the study which was directed at analyzing comprehension questions from manuals of two Canadian reading programs at the grade five level.

First a discussion of the procedure for selecting the sample of questions that were analyzed in this study is discussed. The Question Categorization System which was developed by the researcher for analyzing comprehension questions is outlined, along with an explanation of the steps to be followed in administering the instrument. Procedures for establishing the reliability of the Question Categorization System are discussed. The purpose of the Pilot Study, along with a discussion of its influence on the main study is presented. Finally, outlines and explanations of the two major stages involved in the treatment of the data are provided.

3.2 Sample

3.2.1 Selection of Reading Series

The questions which formed the sample in this study were drawn from teacher's manuals from each of the Ginn and Nelson basal reading series. Despite the argument that most basal reading series are quite similar, these particular

programs were selected because traditionally, they have represented somewhat different approaches to the teaching of reading. Although the authors of both series consider reading to be a cognitive based process and centered in one of the language arts, the Ginn program (Moore, 1974, 1975) appears to be characterized by a hierarchical skills approach and the Nelson (McInnes and Hearn, 1977) by a strong literature emphasis. Because of the differing orientations of the two programs, it was thought that these particular programs might employ questions differently in the teaching of reading comprehension.

Two textbooks are published in each series at the grade five level. The books that were used for the analysis of the Nelson series were: Northern Lights and Fireflies (McInnes and Hearn, 1971) and Kites and Cartwheels (McInnes and Hearn, 1972). The books used in analyzing the Ginn series were: Starting Points in Reading b1 (Moore, 1973) and Starting Points in Reading b2 (Moore, 1974).

3.2.2 Selection of Stories and Poems

Selection of the passages to be analyzed was made after four textbooks were read and the content categorized according to the seven types of genre that Huus (1981) outlined as being common in children's books. There were a total of 81 selections in the Nelson series and 101 selections in the Ginn series. The distribution of selections within each genre is indicated in Table 3.1.

Table 3.1

Distribution of Total Selections Within Series

According to Genre

	Genre	Ginn	Nelson
I	Traditional Tales of a Culture	30	3
II	Fantasy	6	4
III	Historical Fiction	2	0
IV	Contemporary Fiction	19	9
V	Information	3	22
VI	Poetry	41	41
VII	Drama	0	2
Total		101	81

A complete outline of the categorization of selections by title is included in Appendix A.

Originally it was arbitrarily determined that a collection of five stories from both series within each genre would supply an adequate sample of questions for analysis. This standard did not prove to be applicable for each type of genre, since in some cases there were not five stories in a series of that particular kind. As a result, the number of stories to be selected was determined by the series that had the smallest number of stories. For example, in the first category, there were a total of thirty Ginn stories but only three Nelson stories that fit the story genre of "Traditional Tales of a Culture". Consequently a total of three stories was selected from both series. Since there were two "Historical Fiction" stories in the Ginn series and no stories of this genre in the Nelson, the researcher did not analyze any questions pertaining to "Historical Fiction" selections. A similar situation existed with plays in the "Drama" category. The chart in Table 3.2 summarizes the distribution of the fifty six stories and poems that were used in the research.

Although McInnes (1981) asserted that the Nelson stories may be read in any particular sequence, the Ginn stories are considered to be arranged in order of increasing difficulty. For this reason, it seemed important that an identical selection procedure should be followed in choosing the questions for the present study. Three conditions were

Table 3.2

Distribution of the 56 Stories and Poems Within Series According to Genre

	Genre	Ginn	Nelson
I	Traditional Tales of a Culture	3	3
II	Fantasy	5	5
III	Historical Fiction	-	-
IV	Contemporary Fiction	7	7
V	Information	3	3
VI	Poetry	10	10
VII	Drama	-	-
		28	28
Total		56	

established as necessary guidelines for making the selection. First, there should be an equal number of stories and poems drawn from both texts within each series. Second, the sample should be based on stories and poems at the beginning, middle and end of the textbook. Finally, stories and poems within each genre should be similar in topic and length.

Some exceptions to the previously listed conditions did occur. First, it was not possible to choose an equal number of selections from each text when stories of a particular genre were contained in one book and not in the other. Second, not all stories and poems belonging to the same genre were evenly distributed at the beginning, middle, and end of a text. Third, after the first two conditions had been met, there was not always an even match between stories, in terms of their topic and length. Despite the three previously described exceptions, in most instances, the selections were matched according to number and placement in the text as well as similarity in topic and length.

3.2.3 Selection of Questions

All of the comprehension questions pertaining to the 56 selected stories and poems were transcribed for analysis. There were a total of 616 questions included in the sample for this study. Table 3.3 depicts the distribution of questions between the two series. Twenty-six percent of the

Table 3.3

Distribution Between Series of Questions Selected for Analysis

	Ginn	Nelson	Total
Questions in series:	458	158	616
% of Total Questions:	74.4	25.6	100.0

questions in the total sample were drawn from the Nelson series and seventy-four percent were from the Ginn series.

3.3 Categorization System for Comprehension Questions

A categorization scheme, consisting of five specific types of question-answer relations, was developed by the investigator for the purpose of analyzing the comprehension questions. This analysis system was aimed at capturing the relationship between the internal text information and the external text information that a reader must draw from in order to answer a comprehension question. Internal text information was defined as the author's written information. External text information was defined as information drawn from one or more of the following areas: (1)the reader's prior knowledge and experience, (2)the reader's subjectivity in terms of his or her personal ideas, biases or preferences, and (3)any prescribed opinion stance that might

be embedded in a teacher's question.

The Question Categorization System does not represent a learning hierarchy, nor does it describe developmental stages in children's cognitive responses to written materials. It provides a system for organizing various types of reading behaviour into categories, useful for determining the types of content used in thinking which comprehension questions promote.

Five categories of question-answer relations were developed and designated as *A*, *B*, *C*, *D*, and *Rh* (Rhetorical). These specific categories came under the general categories of "narrow" and "broad" questions. *Rh*, *A*, and *B* questions were identified as narrow and *C* and *D* questions were considered to be broad. In determining how to categorize a question, the researcher examined the data base for the answer, the cognitive processes required of the reader, and the final response requirement. Each of these considerations are described separately and then specifically applied to an example in the description of each of the five categories.

The information sources or data base used to answer questions differed according to the types of questions asked. Four possible areas that a reader might draw from in generating an answer were: (1)the text, (2)the reader's prior knowledge and experience, (3)the reader's subjectivity, and (4)the teacher's question. These four areas were abbreviated, on the analysis sheet under "Data Base for Answer", as "Text", "Ext." "Subj." and "T.Q.".

"Text" stands for the text and refers to the written information that is provided by the author. "Ext." stands for external and represents the reader's prior knowledge and experiences. "Subj." stands for subjectivity and refers to the personal ideas, biases or preferences of the reader. "T.Q." stands for teacher question and represents the prescribed options, embedded in a teacher question, which the student is forced to choose from.

The cognitive process engaged in by the reader was considered as the type of thinking that a student might operate with when interacting with the print. These operations range from the acts of choosing, recalling and explaining to those of inferring, hypothesizing and evaluating. A complete listing of all the possible cognitive operations that a reader may utilize will be outlined within the description of each question category.

The response requirement simply was a description of the breadth of answers that may be acceptable within each category of question. Questions that called for <u>one</u> acceptable answer or <u>few</u> acceptable answers were obviously grouped under the general category of "narrow". Those that allowed for <u>many</u> acceptable answers were grouped under the general category of "broad". All of the responses to the questions were considered to be directly or indirectly derived from the text information.

The succeeding sections provide a description of the *A*, *B*, *C*, *D*, and *Rh* questions. Sample questions are included

with the discussion of each of the categories.

3.3.1 A Category

Data base for answer.

The text information provides the sole data base for the answer. The answers to the questions are obviously contained on the printed page.

Description of cognitive process.

The reader draws specific information from the text to form one correct answer. The answer may virtually be "lifted off the page" and therefore the reader is not required to organize any of the text information.

The question may require the reader to recall specific facts or to define specific terms which have been explicitly stated in the text. *A* category questions that involve the cognitive operations of recalling and defining are similar to what Pearson and Johnson (1978) referred to as "textually explicit" questions. Pearson and Johnson (1978) characterized these questions as ones in which the question and the answer are derived from the text and in which the relation between the question and the answer is explicitly cued by the language of the text. This explicit cuing is illustrated in the two following examples of question-answer relations:

Recall

Question: "Why would the leopard lurk close to the trail?" (Moore, 1975, p. 116)

Text: "The leopard would lurk close to the trail between the villages, because that was where he would find lone travellers." (Moore, 1974, p. 118)

Define

Question: "What is a throttle?"

Text: "A throttle is a valve used to regulate the flow of steam or gasoline vapor to an engine."

Some *A* type questions require answers which are not necessarily cued by the language of the text. They still fit in the *A* category because the reader does not have to organize any information. He or she becomes engaged in the cognitive operations of identifying and naming.

Name

Question: "Who comes to the cottage?"

(McInnes, 1977, p. 84)

Text: "The old woman took the lamp from the low table and went to the door. She opened it slowly. The light from the lamp shone on a queer old man who had the unmistakable look of the woods." (McInnes, 1971, p. 74)

List

Question: "What suprises did he find inside the whale?" (McInnes, 1977, p. 151)

Text: "And there right in the whale's stomach the raven was amazed to see a large comfortable cabin. Inside it a lamp was burning brightly, and its walls and floors were covered with soft hides. Along the wall there was a spacious skin platform covered with fur. And there

resting on the skin platform was the most beautiful young woman the raven had ever seen.

(McInnes, 1971, p. 159)

The preceding samples illustrate that not all of the *A* category questions have answers in the text which are cued by the grammatical structure of the text information. These questions require very little language expansion on the part of the student. All that is required is the utterance of a few words, reflecting a reproduction of words from the text.

Response requirement.

The only acceptable answers are those which must be drawn from the text data.

3.3.2 B Category

Data base for answer.

The primary data base for the answer is the text information. The reader, however, must use his background knowledge and experiences as a screen through which he sifts out the relevant text information that should be included in the answer. In this sense, the reader's background knowledge and experience is involved in the formulation of the answer but does not function as part of the data base for the answer.

Description of cognitive process.

The reader selects and organizes relevant facts from the text, putting these facts into a logical and sequential order to construct a reasoned conclusion. The *B* category

question corresponds closely to Pearson and Johnson's (1978) "textually implicit" question. The answer is on the page, but it is not as obvious an answer as with an *A* category question. There is no grammatical cue that links a *B* category question to the answer in the text. The reader's background knowledge and experiences enable the reader to determine which facts from the text are relevant to the question being asked. All of the information that is necessary to arrive at an answer is given in the text.

The reader may explain an action, event, or phenomena by inter-relating the facts that are stated in the text. The cognitive operation of explaining is illustrated in the following sample.

Explain

Question: "Why did she allow him to come in?" (McInnes and Hearn, 1977, p. 84)

Text: "At last she said, "Then come in, it is so rare for a cat to be able to talk that I'm sure one should listen to him when he does." (McInnes and Hearn, 1971, p. 76)

In answering a *B* category question, the reader may also restate or translate text information in a form that is different from what has been presented in the text. The cognitive operations of restating and translating are characterized in the following question/answer relation.

Restate/Translate

Question: "What does he offer to do?"

(McInnes and Hearn, 1977, p. 84)

Text: "I have come to seek shelter and work," answered Pierre Lablanc. "I am getting too old to trap for furs or work in the lumber camps. I would like a job on just such a cozy little place as this."

(McInnes and Hearn, 1971, p. 74)

Some questions within the *B* category may require the reader to select relevant facts for the purposes of comparison and contrast. This operation is typified in the following sample:

Compare/Contrast

Question: "In what ways do you think Rufus and Martin were alike?"

(Moore, 1974, p. 24)

Text: "... when Rufus was barking furiously, straining and leaping at the end of the run. It reminds me of when you were a little boy, Martin. We had the whole backyard fenced in the way it is now, just so you'd have a lot of space to play in and still be safe. But were you satisfied? You were not. You'd plaster yourself against the gate and yell louder than Rufus there."

(Moore, 1973, p. 38)

The preceding samples of questions and corresponding date base for answers indicate that no structural segment of the question is embedded in the text. Therefore there is no explicit cue that the reader may use as an indication of the correct answer. On the other hand, the text has very clearly

established the parameters of the answer so that the reader must base his response on the factual information provided by the author.

Response requirement.

There are few acceptable answers. These answers must be drawn from the text data.

3.3.3 C Category

Data base for answer.

The reader's answer is drawn from sources of information that are both internal and external to the text. Internal information is the actual text information that is explicitly stated by the author. External information is the store of information that the reader possesses as a result of his own prior knowledge and experiences. The reader's background knowledge and experiences perform a different function in *C* category questions than in *B* category questions. With *B* questions this external information serves as a selector of text information, whereas in *C* questions, it serves as a contributor of additional information to the text information.

Description of cognitive process.

A *C* category question requires the reader to select text segments and synthesize them with his or her mental store of generalizations and concepts which have been developed from prior knowledge and experiences. The reader progresses through a chain of logic in order to come to a

reasoned conclusion that was not clearly recognizable in the author's text information. In essence, the reader must "fill in the gaps" that have been left by the author. Pearson and Johnson (1978) refer to this as reading "beyond the lines".

The cognitive operations that a reader may engage in when answering *C* category questions are: (1)inferring, (2)hypothesizing and (3)predicting.

When inferring, the reader arrives at an answer through what Schank (1982) describes as making best guesses about what the author must have meant, apart from what is explicitly stated in the text. The following sample is an example of an inferencing question relating to the story entitled "The Knights of the Silver Shield" (Moore, 1973, pp. 200-209).

> Question: "What was the battle that Sir Roland fought and won?" (Moore, 1974, p. 164)

Sir Roland's battle is actually an inner one in which he has to decide whether to obey the orders of his superior or to succumb to his personal desire to join the other knights in a combat against some giants. The author has not explicitly stated this information in the story. The question, however, forces the reader to think beyond a description of a battle between knights and giants to consider the underlying significance of what the author is communicating.

When a *C* question requires an hypothesis, the reader provides a likely reason or explanation for a particular phenomena or occurrence. Another sample question relating to

the previously cited story illustrates the focus of an hypothesizing question:

Question: "Why was it the hardest battle of all?"

(Moore, 1974, p. 164)

In this question the reader provides explanatory information regarding the difficulty of the inner battle that Sir Roland experienced. Although both the hypothesizing and the inferring questions direct the reader to think about the author's implied information, there does appear to be a subtle distinction between the two cognitive operations. With regards to the author's implied meaning, an inference describes what the meaning is, whereas, an hypothesis explains why the meaning exists.

The third cognitive operation that a *C* category question might elicit from the reader is that of predicting. This occurs when the reader predicts future events, or assuming if circumstances were altered, predicts what the outcome might be. These questions are quite easily identifiable. The following sample question is related to a Nelson story entitled "All Fall Down" (McInnes, 1971, pp. 108-117)

Question: "What other situations might arise where Silver's life might be in danger?"

(McInnes and Hearn, 1977, p. 113)

Response requirement.

C Category questions allow for many acceptable answers. The reader's reasoned conclusion is a plausible, non-textual

response which does not conflict with, but is not directly derived from the text information.

3.3.4 D Category

Data base for answer.

The reader's answer is based on the text information, personal background knowledge and experiences as well as his or her subjective ideas, biases, or preferences. Although the subjective element of the data base is generated out of one's past experiences, it begins to carry an individual influence in *D* category questions that did not exist in the *C* category questions. For that reason it is considered to be the third element that provides a data base for the answer.

Description of cognitive process.

The reader organizes the text information, his/her prior knowledge and experience, and his/her subjective opinions to form an evaluation that is based on criteria established by the reader or by the questioner. The reader's evaluation of the text may be either an external one or an internal one. An external evaluation occurs when the reader evaluates from the point of view of an outside observer. An internal evaluation occurs when the reader projects himself into an actual story character or event. For both types of evaluation questions, a reader may be asked to defend or support his judgment.

In order to maintain a distinction, when analyzing questions, an external evaluation question is referred to as

DI and an internal evaluation question as *DII*. Questions requiring defence or support of external evaluation questions (*DI*) are referred to as *DIs* and of internal evaluation questions (*DII*) as *DIIs*.

An external evaluation (*DI*) occurs when the reader evaluates the author's ideas, story events, or characters according to criteria such as the following: fact or opinion, bias, point of view, truthfulness, adequacy of information, worth, desirability, completeness or acceptability. Three of these criteria are reflected in the following sample questions.

DI - Adequacy of text information.

Question: "How suitable was the title?"

(McInnes and Hearn, 1977, p. 100)

DI - Desirability of story events.

Question: "What word do you think had the best shape?"

(Moore, 1974, p. 66)

DI - Worth, or desirability of the character.

Question: What was your opinion of Martin after you read the first two pages of the story?"

(Moore, 1974, p. 24)

The *DIs* questions require the reader to respond in defence or support of an external evaluation. Within this sub category the reader may operate from one of two positions. First, he may defend or support an evaluation that he personally gave in a preceding *DI* question. These questions are usually worded as "why or why not". The second

position may be when the reader supports an evaluative statement that is given by the teacher. The information that is provided by the teacher does not force the reader to assume an opinion stance, but rather is a presentation of some widely accepted opinion regarding a segment of the text. The reader reasons out an answer from information both internal and external to the text in order to support the evaluation given by the teacher. In the following example, the widely accepted evaluation that the teacher presents is the fact that Dracula has been popular for many years.

> Question: "Why do you think Dracula has been so popular for so many years?" (Moore, 1975, p. 93)

The reader makes an internal evaluation (*DII*) when the question requires him: (1) to evaluate according to his emotional response to the text information, or (2) to project himself into a character's personality or a specific story situation. The following examples serve to clarify these two possible *DII* questions.

> *DII* - Emotional response to text information.
>
> Question: "How did you feel when you discovered the ending?" (McInnes and Hearn, 1977, p. 123)
>
> *DII* - Projection into a Specific Story Situation.
>
> Question: "What would you have done if you had been lost as Tim was?" (McInnes and Hearn 1977, p. 59)

The *DIIs* question follows a *DII* question and requires the reader to defend or support the internal evaluation that he made.

Response requirement.

The response requirement for a *D* category question is quite broad. There are many acceptable answers, all of which are based on, but not directly derived from the text data.

3.3.5 Rh (Rhetorical) Category

Data base for answer.

The data base for an answer to an *Rh* question appears to be similiar to that of a *D* question, however there is little allowance for any individual thinking on the part of the student. The question influences the answer and therefore the date base for the answer is considered to be the teacher's question. All of the information that the student might need in order to provide an answer is presented within the teacher's question. In fact, although the question relates to the text information, the reader might be able to form an answer without having personally read the text.

Description of cognitive process.

Teachers sometimes ask questions which are actually rhetorical in the sense that an answer is not necessary and if one is given, it is essentially of a low level, requiring little thought. Because of the nature of the question-answer relation, the term Rhetorical, abbreviated as *Rh* was used as the title for the fifth question category.

Rh questions force the reader to choose a prescribed opinion stance before he has had a chance to call up or

assemble the necessary data to formulate an answer. The student's thinking is deliberately restricted in that the reader is presented with one or more options that are actually embedded in the teacher's question. The thinking that the student engages in may be that of "reading the teacher's mind".

The reader may simply be required to give a "yes" or "no" response. When this occurs, the succeeding question provides a clue as to whether or not a question should be categorized as *Rh*. The following questions provide an example of such a sequence.

> Question (1) "Do you think the old woman was who she appeared to be?"
>
> Question (2) "Could she have been sent to lure Sir Roland away from the castle?" (Moore, 1974, p. 165)

The first question might appear to be a *DI* question of evaluating the truthfulness of a story character. The second question, however, confirms that there is only one acceptable response to the first question, and therefore both questions are categorized as *Rh* requiring but <u>yes</u> or <u>no</u> responses.

A second type of *Rh* question, which requires more than a yes/no response, is one in which the reader may select from options embedded in the question. Once again, the reader is forced to consider what the questioner is expecting as an answer.

Question: "Do you think that a rabies epidemic would be

more dangerous in the north or in a town where there was a larger population?" (McInnes and Hearn, 1977, p. 113)

Sometimes an *Rh* question requires the reader to defend or support his answer. These are typically the "why or why not" questions and are referred to as *Rhs*.

Response requirement.

There is only one acceptable answer to an *Rh* question. Although the question is text related, the answer is contained in the teacher's question.

The charts in Tables 3.4 and 3.5 summarize the information which characterizes each of the five categories of questions.

Table 3.4

Summary of Question Categories Involving Simple Mental Processing

Specific Category	Rh-Category	A-Category
General Category	Narrow	Narrow
Data Base for Answer	(1) T.Q.: options in teacher question	(1) Text: written information
Description of Cognitive Process	- choose prescribed opinion stance, which may be: (1) yes or no or (2) an option embedded in the question.	- recall facts and definitions where question/answer relation is cued by language of text. - identify, name, or list people objects, or characteristics, stated in text. - no organization of text.
Cognitive Operations	1. choose	1. recall 2. define 3. identify 4. name/list
Response Requirement	- one intended answer	- one correct answer
Possible Sub-Categories	- directly derived from question RhI RhIs	- directly derived from text A

Table 3.5

Summary of Question Categories Involving Complex Mental Processing

Specific Category	B-Category	C-Category	D-Category
General Category	Narrow	Broad	Broad
Data Base for Answer	(1) Text: written information	(1) Text: written information (2) Ext.: prior knowledge & experience	(1) Text: written information (2) Ext.: prior knowledge & experience (3) Subj.: subjective opinions
Description of Cognitive Process	- select and organize relevant text information into a logical and sequential order to construct a reasoned conclusion. - no grammatical cue linking question and answer.	- select relevant text segments for synthesis with reader's prior knowledge and experience, to come to a reasoned conclusion, not clearly recognizable in the text.	- organize prior knowledge and experience subjective opinions, and text information to form an external or internal evaluation.

Table 3.5 (cont.)

Description of Cognitive Process (cont.)	B-Category	C-Category	D-Category - criteria for evaluation established by student or questioner
Cognitive Operations	1. explain 2. translate 3. compare/contrast	1. infer 2. hypothesize 3. predict	1. evaluate/value 2. defend/support
Response Requirement	- few acceptable answers - indirectly derived from text	- many acceptable answers - based on, but not directly derived from text - must not conflict with text	- many acceptable answers - based on text
Possible Sub-Categories	B	C	DI - external evaluation DIS - support of DI DII - internal evaluation DIIS - support of DII

3.4 Administration of Categorization System

The Question Categorization System that was described in the preceding section was used to analyze all of the text dependent questions in the sample. The following section describes the standard procedure that was used with this test instrument. The steps in categorizing the comprehension questions basically follow the general format of the research analysis sheet, which is displayed in Table 3.6.

The first step in analyzing the questions was to reread the story or poem in the student text, along with the accompanying lesson outline in the teacher manual. Next, all of the questions and instructions to the teacher, which pertained to the selection in the student text, were transcribed on to the analysis sheet. This data was recorded in the same order and format in which it appeared in the teacher manual.

The third step involved a close rereading of the story to locate the specific sections of the story upon which the question was based. Numbers of the page(s) and paragraph(s) were entered in the column entitled "Text Base for Question". When the text information was explicitly stated, a complete quotation from the text was written in this column. When text information was implicitly stated, the page and paragraph numbers of relevant data were written in. The researcher then decided whether the information cited in the "Text Base for Question" column was complete or incomplete. It was checked off as "C" (complete) if all the

Table 3.6

Sample Analysis Sheet For Use With

Question Categorization System

Grade___ Series_____ Book_____ Story Title_____ M.pg.__ R.pg.__ Genre_____

#	Question	Text Base for Answer		Data Base for Answer				Category					Notes
		C/IC		Text	Ext.	Subj.	T.Q.	Rh	A	B	C	D	

necessary information to answer the question had been cited from the text or the teacher question. The question was checked as "IC" (incomplete) if the question required more information than what had been cited, in order to arrive at an answer.

The fourth step of the analysis of questions involved a consideration of the data base that the reader would have to draw from in order to answer the question. The four possible sources from which the reader might draw information for constructing an answer were (1) the author's written information ("text"), (2) reader's prior knowledge and experience ("external"), (3) reader's personal opinions and biases ("subjectivity") and (4) choices embedded in the question ("teacher question"). A check mark(s) was placed in the column(s) representing the appropriate source(s) of information the reader might use as a data base for an answer.

Finally, on the basis of the previously selected information regarding the data base for the answer, one appropriate question category (*A*, *B*, *C*, *D*, or *Rh*) was selected.

The *A*, *B* and *C* questions were simply checked in the appropriate column and then the cognitive operation (eg. "naming", "explaining", "hypothesizing") was written in the adjoining column. For the *D* and *Rh* questions, the actual symbol, *DI*, *DIs*, *DII*, *DIIs*, *Rh*, or *Rhs* was entered in the appropriate column and therefore there was no need to note

the cognitive operation that the reader might engage in.

3.5 Reliability of Question Categorization System

To establish the reliability of the writer's judgement in categorizing the comprehension questions, a portion of the data was submitted to a panel of two judges for coding. The judges were classroom teachers who had been trained by the researcher in the use of the Question Categorization System. The judges were also provided with an accompanying manual which they were able to study individually, refer to during practice sessions, as well as during the inter-rater reliability test. A copy of this manual is contained in Appendix B.

Sixteen stories and/or poems were randomly selected from the research sample. A stratified sample was constructed by dividing the total number of questions per selection into four parts. Then the first four questions were taken out and recorded on analysis sheets for categorization by the raters. After a training and practice session, the judges read eight stories and categorized thirty-two questions according to the five part Question Classification System which was described in the previous section.

Inter-rater agreement was calculated through the use of the Arrington formula as outlined by Feifel and Lorge (1950). In this formula, the agreements are doubled and then

divided by this total, plus the disagreements.

$$\frac{2 \times \text{agreements}}{(2 \times \text{agreements}) + \text{disagreements}}$$

The results showed an average agreement between the investigator and judges as 89 percent.

3.6 Pilot Study

The purposes of the Pilot Study were:

1. to assess the appropriateness and exclusiveness of the categories in the Question Classification System.
2. to determine the extent of information from the manuals that would be analyzed in the main study.

A total of 123 comprehension questions were analyzed in the Pilot Study. The questions were drawn from the Ginn and Nelson manuals for the grade four programs. Two stories from each of the 4 books were read and all of the related information, regarding comprehension development, was transcribed from the manuals. The Question Classification System was used to analyze the comprehension questions.

The Question Classification System was revised as a result of the Pilot Study. Originally the system had been composed of four categories: *A*, *B*, *C* and *D*. A fifth type of

question existed which did not fit any of the question-answer relations that were described in the first four categories. Certain common characteristics set these questions apart as a separate category. These questions were worded in a forcing way so that the student would not be allowed to think independently, but rather would have to think of what answer the question implied and an answer could be formulated on the basis of the information provided in the question. Although it might appear that a student would engage in one of the cognitive operations outlined in question categories, *A*, *B*, *C* or *D*, the main cognitive operation was that of choosing an opinion stance from two or more options. Therefore, a fifth category, referred to as *Rh* (Rhetorical) was formed to describe these questions.

Differences in the style of the manuals created three problems which had to be resolved as a result of the Pilot Study. The following section describes (1) what each issue was, (2) why it created a problem, and (3) how the issue was handled in the main study.

A problem for categorizing was whether to include teacher instructions. In some cases, the manual provided instructions that a teacher could potentially utilize in the form of a question. These instructions were transcribed in the sequence but were not analyzed, the rationale being that instructions had the potential for becoming either convergent or divergent questions. Since the student's response would be dependent on how the teacher worded the

question, any attempts to analyze the teacher instructions would result in inaccuracy. These items were recorded, however, since it seemed important to be able to determine if the manuals were providing more general suggestions regarding questions or whether they were providing more explicitly stated questions for teacher use.

A second kind of problem in recording questions was how to determine the use of adjunct materials from the manuals and text. In some cases, the manual carried explicitly stated questions regarding information contained in accompanying study books and student workbooks. Since one series followed this format and the other didn't, it was decided that these questions should not become part of the sample.

The third problem was what to do with exercises in the manual, which often were a series of five to ten "multiple choice", "matching", or "true/false" questions. Since these questions provided little information on question sequences, the exercises were not included in the sample.

In summary, the Pilot Study, resulted in four decisions regarding the analysis of the data in the main study. First, the *Rh* (Rhetorical) category was added to the Question Categorization System. Secondly, it was decided that teacher instructions should be transcribed within the sequence of questions, but would not be analyzed. Thirdly, any questions in the manuals that were based on adjunct materials other than the student text would be excluded from the sample.

Fourth, all lists of true/false, multiple choice, and fill-in-the-blank questions would not be analyzed or recorded.

3.7 Treatment of Data

Two stages existed in the treatment of the research data. First, all questions in the manuals were transcribed and categorized. Second, the questions were analyzed to determine the extent to which the Taba (1965) model of questioning sequences was being incorporated into the questioning strategies in the teacher's manuals. The following discussion explains how the data was treated at both stages.

3.7.1 Stage One

All comprehension questions pertaining to the 56 selected stories and poems were transcribed for analysis. Only those questions which were sequenced before, during, or after the reading of the story or poem were considered as data for this study. Questions were either <u>text dependent</u>, that is not answerable without knowledge of the written information in the text, or <u>text independent</u>, that is being answerable prior to reading the selection.

The total text dependent questions, between both series, was 507 and the total text independent questions was 103. Table 3.7 summarizes the division of text dependent and

text independent questions within the Nelson and Ginn series. A complete outline of text dependent and text independent questions within genre and selection is included in Appendix C.

Text dependent questions.

Text dependent questions were categorized according to the five categories, *A*, *B*, *C*, *D* or *Rh*, of the Question Categorization System. These categories reflect the range of information sources a reader may draw from as well as the cognitive operations he might engage in when answering a question.

Text independent questions.

Text independent questions were categorized according to four possible purposes: (1) focussing attention, (2) setting a purpose for reading, (3) providing background, or (4) developing vocabulary. Although most text independent questions were pre-reading activities some were suggested during the reading, for focussing attention or developing vocabulary.

In summary, Stage One involved the following procedures.

1. All questions were transcribed and grouped as text dependent or text independent.
2. Text dependent questions were categorized into a possible range of five categories of question-answer relations according to the Question Categorization System.

Table 3.7

Distribution of Text Dependent and Text Independent Questions, According to Genre, Within the Manuals of Ginn and Nelson Reading Programs at the Grade Five Level

Genre:	Text Dependent		Text Independent	
	Ginn	Nelson	Ginn	Nelson
I	59	27	14	0
II	65	21	12	18
III	-	-	-	-
IV	159	44	19	7
V	42	4	5	5
VI	75	11	8	21
VII	-	-	-	
TOTAL:	400	107	58	51
	507		109	
	616			

3. Text independent questions were categorized according to four purposes:
   a. focussing attention
   b. setting a purpose for reading
   c. providing background
   d. developing vocabulary

3.7.2 Stage Two

The second stage in the treatment of the data involved a close study of the questions to determine the presence and extent of planned sequences and strategies. The theoretical framework of Taba (1965) provided the medium for comparison.

Taba (1965) outlines a sequence of three types of planned questions for developing student's thinking abilities.

1. Focussing questions establish a mental set or purpose for reading. They specify the cognitive process and delimit the topic on which the process is to be performed.
2. Extending questions elicit additional information on the same subject by providing elaboration, clarification, or extension of information already provided.
3. Lifting questions make a transition from assembling descriptive information to explaining certain items in the information. These questions elicit additional information on the same subject, but at a higher level of thought.

A sequence was considered to exist when the second question was related to, dependent on, and was developing information in the first. This was opposed to groupings of questions which were related to a common topic but were not developing the subject in terms of lifting or extending the student's thinking. These questions of common topic appeared to be grouped for rapid fire assessment, rather than for development of comprehension. The distinction between a question sequence and a question grouping is apparent in the following examples.

1. Sequence:
   a. Focus, *B* Category question: "Why did the grandfather set the bird free?" (Moore, 1975, p. 143)
   b. Lift, *C* Category question: "What was he telling his grandson by his action?" (Moore, 1975, p. 143)
2. Grouping:
   a. *A* Category question: "Where are electric eels found?" (Moore, 1975, p. 86)
   b. *B* Category question: "What do they look like?" (Moore, 1975, p. 86)
   c. *B* Category question : "Why are they dangerous?" (Moore, 1975, p. 86)

In processing the data, series of questions relating to a common topic were drawn from the data and transcribed in order. The corresponding category or subcategory (*Rh*, *Rhs*, *A*, *B*, *C*, *DI*, *DIs*, *DII*, *DIIs*) was listed beside the question. Some text independent (T.I.) questions were included in a

question series and these were listed as T.I. After determining the relationship between questions, each question series was labelled either as a sequence or a topic-related group of questions. The function (focus, extend, or lift) of each question in the sequence was determined and the pattern was labelled. Some examples of the more common sequence patterns are:

1. Focus-lift

"Which boy would you prefer to have as a friend?"

"Why?" (McInnes and Hearn, 1977, p. 122)

2. Focus-extend

"What is the part of the polar bear a seal might notice against the ice and snow?"

"How did the bear in the story make sure that the seal wouldn't notice it?" (Moore, 1975, p. 13)

3. Focus-extend-lift

"What kind of child is Jack?"

"What kind of person is his mother?"

"What is the conflict between Jack and his mother?" (McInnes and Hearn, 1977, p. 195)

Sequenced, topic-related, and unrelated questions were grouped and the question categories within each of these forms of organization were tabulated. The average numbers of questions used in a sequence and a topic-related grouping were calculated. Sequence patterns (Eg. focus-extend, focus-lift, focus-extend-lift, focus-extend-extend) were grouped as either lifting sequences or extending sequences.

The number of sequence patterns, as well as the number of questions used in specific patterns were presented.

4. RESULTS OF THE STUDY

4.1 Introduction

The purpose of this study was to analyze the questioning strategies used in two basal manuals for teaching reading comprehension. Findings are reported descriptively and tables are presented, when appropriate, to supplement the explanation of the data.

4.2 Nature of Questions

The research sample was composed of questions which were either text dependent, that is were not answerable without knowledge of the text, or were text independent, in that they might be answered without information obtained in the text. The Ginn and Nelson samples differed in the distribution of these two types of questions. The information portrayed in Table 4.1 indicates that, despite the marked difference in sample sizes, Ginn manuals carried a higher percentage of text dependent questions than the Nelson. Approximately 400 questions or 87.3% of the Ginn questions were text dependent as compared to 107 or 67.8% in the Nelson. Text independent questions received higher priority in the Nelson sample, representing 32.3% of the program sample and a lesser priority in the Ginn, representing 12.7%.

Table 4.1

Frequency and Percentage of Text Dependent and Text Independent Questions Within Individual Ginn and Nelson Samples

	Ginn		Nelson	
	Freq.	%	Freq.	%
Text Dependent Questions[a]	400	87.3	107	67.8
Text Independent Questions[b]	58	12.7	51	32.4
Total	458	100.0	158	100.0

[a]Questions with answers based on text information

[b]Questions with answers not based on text information

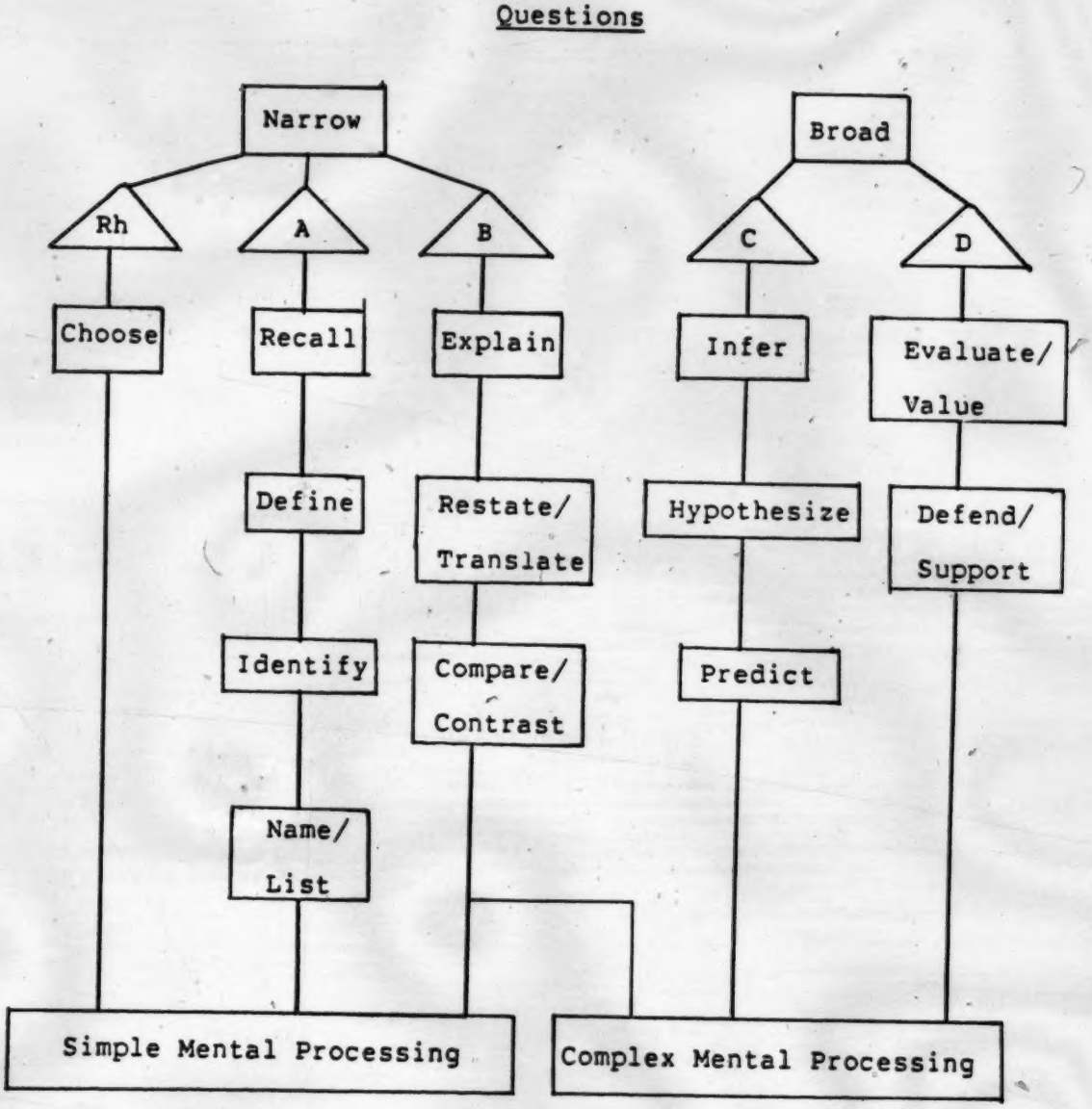
4.2.1 Text Dependent Questions

All text dependent questions, or those not answerable without knowledge of the written text, were categorized according to five mutually exclusive question categories in the Question Categorization System. The System is a modification of two classificatory systems developed by Cunningham (1971) and Pearson and Johnson (1978). The question categories are designed to reflect the range of information sources - teacher question, text, prior knowledge and experience, and/or personal subjectivity, which the reader may draw from in formulating an answer. The categories also serve to outline the thinking processes required by a reader when using any of these information sources to answer various types of comprehension questions. The complexity of the mental processes engaged in by the reader was determined by the extent to which the reader must personally organize available information, when formulating an answer. Simple processing questions required no organization of information, whereas complex processing questions required the reader to select and organize information from varying sources.

An outline chart of the question categories, indicating narrow or broad outcomes, the complexity of mental processing, as well as the cognitive operations required in each category is presented in Figure 4.1. The Question Categorization System is explained in detail on pages to of Chapter Three.

Figure 4.1

Questions Divided According to Narrow and Broad Outcomes with Question Categories and Associated Cognitive Operations Listed.*



*Adapted from Cunningham, 1971

As indicated in Table 4.2, there was a higher percentage of complex processing questions than simple procesing questions in the total sample of text dependent questions. Approximately 64.4% of the sampled questions were of a complex processing nature as compared to 35.6% of a simple processing nature. When considering individual representation by Ginn and Nelson questions, there was a higher concentration of complex processing questions in the Nelson manuals than in the Ginn. Findings indicated that 61.0% (244) of the Ginn sample involved complex mental processing as compared to 76.6% (82) in the Nelson.

The information in Table 4.2 indicates that the largest portion of text dependent questions were in the *C* category, requiring such mental processes as inferring, hypothesizing, and predicting. A total of 171 questions, representing 33.7% of the combined Ginn and Nelson samples were questions of this nature. These *C* category questions, engage the reader in selection and organization of information from the text as well as information from prior knowledge and experience.

The second largest portion of text dependent questions, representing 25.1% of the combined samples, required such mental processes as explaining, restating/translating, and/or comparing/contrasting. Approximately 127 out of the 507 text dependent questions were placed in this *B* category. Questions of this nature require the reader to select and organize information from a single source - the text. Answers to *B* category questions are based on factual

Table 4.2

Distribution of 507 Text Dependent Questions In Ginn and Nelson Teacher Manuals For Grade Five Reading Programs

	Simple Mental Processing Questions									Complex Mental Processing Questions									
	Rh			A			Total			B			C			D			Total		
	Freq.	Percentage		Freq.	Percentage		Freq.	Percentage		Freq.	Percentage		Freq.	Percentage		Freq.	Percentage		Freq.	Percentage	
		Comb.	Ind.		Comb.	Ind.		Comb.	Ind.		Comb.	Ind.		Comb.	Ind.		Comb.	Ind.		Comb.	Ind.
Ginn	99	19.5	24.8	57	11.2	14.3	156	30.7	39.1	83	16.4	20.8	144	28.4	36.0	17	3.4	4.3	244	48.2	61.0
Nelson	19	3.7	17.8	6	1.2	5.6	25	4.9	23.4	44	8.7	41.1	27	5.3	25.2	11	2.2	10.3	82	16.2	76.6
Total	118	23.2		63	12.4					127	25.1		171	33.7		28	5.6				
Grand Total							181	35.6											326	64.4	

Thinking processes required in question categories:

Rh - choosing

A - recalling, defining, identifying, or naming/listing

B - explaining, restating/translating, or comparing/contrasting

C - inferring, hypothesizing, or predicting

D - evaluating/valuing or defending/supporting

information provided by the author, however no structural segment of the question is embedded in the text to serve as an explicit cue to the answer.

Following closely, in order of frequency, were 118 (23.2%) forced choice questions which may involve little thought when answering. These *Rh* (Rhetorical) questions force the reader to choose (*Rh*) or to defend/support (*Rhs*) a prescribed opinion stance, before having had an opportunity to assemble the data necessary for reasoning out the answers. Answers are basically provided within the teacher question, therefore the reader may need to do little thinking other than choosing and/or supporting a prescribed answer.

Fourth, in order to priority, were 63 (12.4%) questions with answers that were explicitly stated in the text or which might be literally lifted off the page. These *A* category questions engage the reader in such thinking processes as recalling and/or defining explicitly stated facts; or identifying, naming, and/or listing obvious information. Questions of this nature do not require the student to personally select or organize the information when generating answers.

The remaining 5.6% (28) of the combined samples of text dependent questions required mental processes such as evaluating/valuing, and/or defending/supporting. When answering these *D* category questions, the reader selects and organizes content from three possible sources of

information: (1) the text information, (2) prior knowledge and experience, and (3) personal subjectivity.

The preceding section reported findings regarding the frequencies of question categories, along with corresponding mental processes for the combined samples of text dependent questions from the Ginn and Nelson manuals. Since there were differences in sample size as well as in frequency order, the next section reports information from the individual samples.

Table 4.2 indicates that the largest number of questions from the Ginn manual were in the *C* category (emphasizing such thinking processes as inferring, hypothesizing, or predicting). Although these questions occupied 28.4% of the total text dependent sample, the 144 questions represented 36% of the total Ginn questions. The largest number of Nelson questions were in the *B* category, concentrating on thinking processes such as explaining, restating/translating, or comparing/ contrasting. There were 44, *B* category questions which reflected 41.1% of the total Nelson questions.

The mental processes, occupying a second place emphasis, differed in the respective program manuals. The next largest grouping of Ginn questions were those which forced the student to choose an option presented in the question or to submit an optional yes or no response. There were 99 of these *Rh* questions, representing 24.8% of the Ginn questions. This emphasis on simple mental processes

contrasted with the Nelson emphasis on the complex mental processes of inferring, hypothesizing, or predicting. The 27 *C* category questions, receiving second place emphasis in the Nelson manuals, represented 25.2% of the total Nelson questions.

The third largest number of questions from Ginn manuals required processes of explaining, restating/translating, or comparing/contrasting for selecting and organizing relevant segments of the text. There were 83, of these *B* category questions, representing 20.8% of all the Ginn questions. In contrast, the third largest number of Nelson questions required relatively little mental processing. A total of 19 *Rh* questions represented 17.8% of the Nelson questions.

Narrow, *A* category questions, which call for the recalling, defining, identifying, naming or listing of obvious text information represented 14.3% (57) of the Ginn sample as compared to 5.6% (6) of the Nelson sample. *D* category questions which allow for broad answers of evaluation or valuation as well as defence or support of these answers, were evident in 4.3% (17) of the Ginn questions and in 10.3% (11) of the Nelson.

4.2.2 Text Independent Questions

All text independent questions were grouped according to four possible purposes: (1) focussing attention, (2) setting purposes for reading, (3) providing background, or (4) developing vocabulary. As indicated in Table 4.3, the

Table 4.3

Distribution of 109 Text Independent Questions In Ginn and Nelson Teacher Manuals For Grade Five Reading Programs

	Purposes										Total		
	Focusing Attention			Setting Purposes			Providing Background			Developing Vocabulary					
	Freq.	Percentage		Freq.	Percentage		Freq.	Percentage		Freq.	Percentage		Freq.	Percentage	
		Comb.	Ind.		Comb.	Ind.		Comb.	Ind.		Comb.	Ind.		Comb.	Ind.
Ginn	16	14.7	27.6	11	10.1	19.0	20	18.3	34.5	11	10.1	19.0	58	53.2	100.0
Nelson	4	3.7	7.8	5	4.6	9.8	29	26.6	56.9	13	11.9	25.5	51	46.8	100.0
Total	20	18.4		16	14.7		49	44.9		24	22.0		109	100.0	

largest portion of questions in the combined sample appeared to be directed at providing background for the student prior to reading. There were 49 questions, or 44.9% of the combined text independent sample of Ginn and Nelson questions, which were aimed at accomplishing this purpose. Questions for vocabulary development represented 22% (24) of the combined samples, followed closely by 18.4% (20) of the questions which were directed at focussing attention. Questions which set purposes for reading were emphasized the least and the 16 questions which were located represented 14.7% of the combined samples.

The individual Ginn and Nelson samples differed in the distribution of text independent questions within the four possible purposes which were considered. Although the highest priority, in both programs, was placed on questions which provided background for reading, these questions represented 56.9% of the Nelson questions as compared to 34.5% of the Ginn questions. Second place emphasis, for Nelson questions, was on those which might develop vocabulary (25.5%) and in the Ginn, on those which served to focus attention on a topic (27.6%). The third place concentration of text independent Ginn questions was equally divided. Approximately 19% of the questions were designed for setting purposes and the other 19% were aimed at vocabulary development. The Nelson sample differed in that 9.8% of its text independent questions were purpose setting and the remaining 7.8% served to focus attention.

4.3 Question Sequences

A question sequence was defined as a connected series of questions in which one question was related to, dependent on, and developed information from those preceding it. In this way a question sequence served to focus on a topic, subsequently extending and/or lifting the students' thinking regarding the topic.

A distinction was made between a sequence of questions and a group of questions related to the same topic. This differing classification was important because sequenced questions were purposefully organized to develop thought regarding a topic whereas grouped questions provided for rapid-fire assessment, rather than student thought development. A topic-related group of questions was defined as a series of questions which do not develop the topic in terms of lifting or extending student thought and do not depend on data from a previous answer to a question.

The distribution of questions which were sequenced, topic-related, or unrelated, within the entire research sample, is displayed in Table 4.4. There were 212 questions, representing 34.4% of the entire research sample, which were organized into 94 sequences. These question sequences were, on the average, composed of only two questions in both the Ginn and Nelson samples.

A total of 54 topic-related questions were located. This portion represented 8.8% of the complete research sample. There were 22 instances of topic-related groupings

Table 4.4

Frequency Distribution of Sequenced, Topic-Related Groupings, and Unrelated Questions (N=616) in Ginn and Nelson Manuals For Reading Programs at the Grade Five Level

	Sequenced Questions					Topic-Related Groupings					Unrelated Questions		
	No. of Questions	Percentage		No. of Sequences	Average No. Questions In Sequence	No. of Questions	Percentage		No. of Groupings	Average No. Questions In Grouping	No. of Questions	Percentage	
		Comb.	Ind.				Comb.	Ind.				Comb.	Ind.
Ginn	162	26.3	35.4	69	2.35	40	6.5	8.7	17	2.35	256	41.5	55.9
Nelson	50	8.1	31.6	25	2.0	14	2.3	8.9	5	2.80	94	15.3	59.5
Total	212	34.4		94		54	8.8		22		350	56.8	

which presented an average of 2.45 questions in each grouping.

Unrelated questions constituted the remaining 56.8% of the total research sample. There were 350 of these questions; 41.5% (256) drawn from Ginn manuals and 15.3% (94) drawn from Nelson manuals.

The internal characteristics of the Ginn and Nelson samples were nearly identical. Approximately 35.4% of the Ginn questions and 31.6% of the Nelson questions were organized into sequences. Topic-related groupings of questions were evident with 8.7% of the Ginn questions and 8.9% of the Nelson. The remaining questions which were organizationally unrelated represented 55.9% of the Ginn questions and 59.5% of the Nelson.

Questions within a sequence were analyzed in terms of the Taba System and labelled according to specific functions: <u>focussing</u>, <u>extending</u>, and/or <u>lifting</u> of student thought. A Taba sequence might begin with a focus question such as, "What character qualities did Sir Lancelot display in the story?" An extending question, aimed at obtaining more information or more data, might be: "What other information is there about this hero?" After enough evidence has been gathered, a lifting type of question might be, "Why do you think Sir Lancelot became such a famous knight?" A Taba question sequence provides an opportunity for students to gather and process relevant information before arriving at a generalization or conclusion.

As indicated in Table 4.5, there were 94 types of extending and lifting sequences located within the 212 sequenced questions from the combined Ginn and Nelson samples. Approximately 70 of the patterns lifted thought and 24 extended thought. The most common sequence patterns were the following two and three questions sequences:

(1) Fifty-four, focus-lift sequences (57.4%)

(2) Twenty, focus-extend sequences (21.2%)

(3) Ten, focus-extend-lift sequences (10.6%)

The remaining 10 sequence patterns were variation of the previously described patterns and are outlined as follows:

(1) Three, focus-lift-extend question sequences (3.2%).

(2) One, focus-lift-extend-extend question sequence (1.1%).

(3) Two, focus-extend-extend-lift question sequences (2.2%).

(4) Three, focus-extend-extend question sequences (3.2%).

(5) One, focus-extend-extend-extend question sequence (1.1%).

Slight differences in the distribution of types of extending and lifting sequences were evident in individual program samples. Approximately 76.7% of the Ginn sample was composed of lifting question sequences as compared to 68.0% in the Nelson. In actual fact, approximately 68% of both samples carried either focus-lift or focus-extend-lift sequences. The additional 8.6% of the Ginn sequences were variations of three and four question sequences which incorporated at least one lift question. Extending thought sequences were evident in 23.3% of the Ginn sample and in

Table 4.5

Distribution of Thought Extending and Thought Lifting Sequences (N=94) of Questions (N=212)

From the Cline and Nelson Teacher Manuals for the Grade Five Level

	Lifting Question Sequences																				Extending Thought Sequences									
	Focus-Lift				Focus-Extend-Lift				Focus-Lift-Extend				Focus-Lift-Extend-Extend				Focus-Extend-Extend-Lift				Total				Focus-Extend				Focus-Extend-Extend				Focus-Extend-Extend-Extend				Total			
	No. Seq.	No. Qu.	Comb.	Ind.	No. Seq.	No. Qu.	Comb.	Ind.	No. Seq.	No. Qu.	Comb.	Ind.	No. Seq.	No. Qu.	Comb.	Ind.	No. Seq.	No. Qu.	Comb.	Ind.	No. Seq.	No. Qu.	Comb.	Ind.	No. Seq.	No. Qu.	Comb.	Ind.	No. Seq.	No. Qu.	Comb.	Ind.	No. Seq.	No. Qu.	Comb.	Ind.	No. Seq.	No. Qu.	Comb.	Ind.
Cline (N=69)	40	80	42.5	58.0	7	21	7.4	10.1	3	9	3.2	4.3	1	4	1.1	1.4	2	4	2.2	2.9	53	118	56.4	76.7	13	26	13.8	18.8	3	9	3.2	4.4	0				16	35	17.0	23.3
Nelson (N=25)	14	28	14.9	56.0	3	9	3.2	12.0	0				0				0				17	37	18.1	68.0	7	14	7.4	28.0	0				1	4	1.1	4.0	8	18	8.5	32.0
Total	54	108	57.4		10	30	10.6		3	9	3.2		1	4	1.1		2	4	2.2		70	155	74.5		20	40	21.2		3	9	3.2		1	4	1.1		24	53	25.5	

32.0% of the Nelson. This portion, in both samples, was primarily composed of focus-extend question sequences.

Information regarding the nature of the question sequences may be more accurately analyzed by considering the type of questions which were used in the sequences. The following discussion presents a detailed description of the categories (*Rh*, *A*, *B*, *C*, *D*) of questions used in the most common sequence patterns: (1) focus-lift, (2) focus-extend, and (3) focus-extend-lift. These patterns represented 89.2% of all the 94 sequence patterns. This will be followed by a general description of the category distribution of all 212 questions used in the 94 sequences.

Findings regarding the question distribution, as displayed in Table 4.6, indicated that the forced choice, *Rh* question, was most frequently used in these sequence patterns. Approximately 47 questions forced the reader to assume a prescribed opinion stance (*Rh*) and 43 questions required support or defence (*Rhs*) of the opinion. These (*Rh*) questions accounted for half of the combined samples of Ginn and Nelson questions used in the three most common sequence patterns. These simple processing, (*Rh*) questions were most heavily emphasized in the focus-lift sequences. There were 34 *Rh* questions and 33 *Rhs* questions used in this particular pattern alone. Differences between individual program samples were clearly evident.

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Table 4.6

Distribution of Question Categories Within Focus-Extend, Focus-Lift, and Focus-Extend-Lift Sequences in Glen (N=127) and Nelson (N=51) Questions

Question Categories	Question Sequences																	
	Focus-Extend						Focus-Lift						Focus-Extend-Lift				Total					
	Frequency G	Frequency N	% of Combined G	% of Combined N	% of Individual G	% of Individual N	Frequency G	Frequency N	% of Combined G	% of Combined N	% of Individual G	% of Individual N	Frequency G	Frequency N	% of Combined G	% of Individual N	Frequency G	Frequency N	% of Combined G	% of Combined N	% of Individual G	% of Individual N
Test Ind.	2	4	1.1	2.2	1.6	7.8	4	12	2.2	6.7	3.1	23.5	3	3	1.7	1.7	9	19	5.0	10.6	7.1	37.2
Test Dep. (Simple Proc.)																						
Rh	1	2	.6	1.1	.8	3.9	30	4	16.8	2.2	23.6	7.8	9	1	5.0	.6	40	7	22.5	3.9	31.5	13.7
Rho	1	2	.6	1.1	.8	3.9	29	4	16.3	2.2	22.8	7.8	6	1	3.4	.6	36	7	20.3	3.9	28.3	13.7
A	2	1	1.1	.6	1.6	2.0	1	0	.6	0	.8	0	0	0	0	0	3	1	1.7	.6	2.4	2.0
(Complex Proc.)																						
B	7	3	3.9	1.7	5.5	5.9	3	0	1.7	0	2.4	0	1	1	.6	.6	11	4	6.2	2.3	8.7	7.8
C	11	2	6.2	1.1	8.6	3.9	9	2	5.0	1.1	7.1	3.9	0	1	0	.6	20	5	11.2	2.8	15.7	9.8
DI	2	0	1.1	0	1.6	0	0	3	0	1.7	0	5.9	1	2	.6	1.1	3	5	1.7	2.8	2.4	9.8
DIa	0	0	0	0	0	0	0	3	0	1.7	0	5.9	0	0	0	0	0	3	0	1.7	0	5.9
DII	0	0	0	0	0	0	2	0	1.1	0	1.6	0	1	0	.6	0	3	0	1.7	0	2.4	0
DIIa	0	0	0	0	0	0	2	0	1.1	0	1.6	0	0	0	0	0	2	0	1.1	0	1.6	0
Total	26	14	14.6	7.8	20.5	27.4	80	28	44.8	15.6	63.0	54.8	21	9	11.9	5.2	127	51	71.4	28.6	100.	100.
Grand Total	40		22.4				108		60.4				30		17.1		178		100.			

Approximately 59.8% of the Ginn questions were from the forced choice, *Rh* category as compared to 27.4% of the Nelson questions.

A summary of the nature of all 212 questions used in sequence patterns is displayed in Table 4.7. A predominant characteristic was that 108 questions, or 50.9% of the sample, required simple mental processing. Questions of this nature were either from the forced choice, *Rh* category or from the literal, explicitly cued, *A* category.

As indicated in Table 4.7, 75 questions, or 35.4% of the sequenced questions involved complex mental processing. These questions allow the reader to select and organize relevant information from sources both internal and external to the text. The remaining 30 questions were answerable without knowledge of the text (text independent) and therefore the nature of mental processing involved in 13.7% of the sequenced question sample was not analyzed.

Differences existed in the nature of sequenced questions used in the Ginn and Nelson samples. Nelson sequences were fairly evenly distributed between 18 simple processing questions, 18 complex processing questions and 16 text independent questions. Ginn sequences, however, were unequally distributed with 90 of the questions being of a simple processing nature. This concentration represented 55.5% of the sequenced questions in the Ginn sample, followed by 35.2% of a complex processing nature and 9.2% which were text independent.

Table 4.7

Distribution of Simple Processing, Complex Processing, and Text Independent Questions (N=212), Organized Into Question Sequences in the Ginn and Nelson Manuals For Reading Programs at the Grade Five Level

	Text Dependent Questions						Text Independent Questions[c]		
	Simple Processing Questions[a]			Complex Processing Questions[b]					
	Freq.	Percentage Comb.	Ind.	Freq.	Percentage Comb.	Ind.	Freq.	Percentage Comb.	Ind.
Ginn	90	42.4	55.5	57	26.9	35.2	15	7.1	9.2
Nelson	18	8.5	36.0	18	8.5	36.0	14	6.6	28.0
Total	108	50.9		75	35.4		29	13.7	

[a]Include question categories: Rh and A

[b]Include question categories: B, C, and D

[c]Questions answered without text information

4.4 Comprehension: Development and Assessment

Comprehension development questions were differentiated from comprehension assessment questions on the basis of two factors: (1) the nature of cognitive processing required by the student and (2) the nature of their organization in the teacher's manual.

Questions, more facilitative of comprehension development, built on information generated from preceding ones and in general tended to be of a complex processing nature, primarily from the *B*, *C*, or *D* categories. Questions which were less facilitative of comprehension development were also of a complex processing nature, however, were not sequenced to build on information generated from preceding questions.

Several factors contributed to less than optimal comprehension development: unsequenced questions and unsupported evaluations. Comprehension development is weakened when questions are randomly arranged, without any purposeful sequence since the student is not given an opportunity to draw up or consider necessary data prior to arriving at a conclusion. Unsupported evaluations require less of the student than questions which call for a defence or support of an answer. Questions characterized by any of these factors were considered to be less facilitative of comprehension development.

Comprehension assessment questions might be topic related, may appear to be organized in sequences, however,

since these questions require a student to engage in simple mental processing they cannot be considered to develop comprehension abilities. Many comprehension assessment questions are not purposefully organized and serve as a tool for rapid-fire assessment. Questions from the *Rh*, forced choice question category as well as the literal, *A* category were considered as comprehension assessment questions.

Information on comprehension development and comprehension assessment questions, as portrayed in Table 4.8, indicates that the basal manuals contained approximately 326 development questions (64.3%) as compared to 181 assessment questions (35.7%). Research also indicated that questions aimed at developing comprehension were not as facilitative of that goal as they might have been if they had been organized into purposeful sequences. Approximately 49.5% of the entire research sample of 507 text dependent questions were considered to be <u>less</u> facilitative of comprehension development. This situation existed as a result of complex processing questions being presented in random fashion, devoid of sequences which might purposefully develop the information base needed to reach reasoned conclusions. Only 14.8% of the total questions were actually presented in a way that would allow for more efficient approaches to comprehension development.

Slight differences existed in the characteristics of the individual Ginn and Nelson samples. Comprehension development questions were emphasized to a greater extent in

Table 4.8

A Comparison of The Distribution of Text Independent and Text Dependent Questions Within Ginn and Nelson Manuals in the Grade Five Level

	Text Dependent		Text Independent		Total	
	Freq.	%	Freq.	%	Freq.	%
Ginn	400	87.3	58	12.7	458	100
Nelson	107	67.7	51	32.3	158	100
Total	507	82.3	109	17.7	616	100.0

Nelson manuals, with 76.6% of the questions aimed at this goal as compared to 61.0% in the Ginn. Approximately 16.8% of the Nelson questions were more facilitative of comprehension development as compared to 14.3% of the Ginn questions. Comprehension assessment questions occupied approximately 39% of the Ginn sample and 23.4% of the Nelson sample.

4.5 Comparison of Ginn and Nelson Comprehension Questions

The most obvious difference between the two programs was in the quantity of teacher questions provided in the manuals. As indicated in Table 3.3, out of a total of 616 questions, there were nearly three times as many Ginn questions as there were Nelson questions in the research sample. Approximately 74% of the questions were drawn from Ginn manuals as compared to 26% from Nelson manuals.

A second difference, relating to the first one, is in regard to the style of presentation given in the manuals. The Nelson series tended to provide more suggestions to the teacher about question topics, as opposed to explicitly stated questions which were predominantly characteristic of the Ginn. The difference between these two approaches is illustrated in two directives drawn from the same story, "The Raven and the Whale" (McInnes and Hearn, 1977, p. 151).

Teacher Direction:

"Ask them to decide if there is any truth to part of the

story."

Teacher Question:

"Why did the people of the island hold the raven in great esteem?"

A third area of difference between the Ginn and Nelson manuals was in the concentration of text independent questions. These were the questions that a student might answer without information from the text. In the main, this type of question serves the purposes of providing background, developing vocabulary, setting purposes for reading or focussing attention. As indicated in Table 4.1, approximately 32.3% of the total Nelson questions were text independent as compared to 12.7% of the total Ginn questions. Both programs placed highest priority on text independent questions which served to provide background for reading. Table 4.3 indicates that more of the Nelson questions (56.9%) were aimed at this purpose than the Ginn (34.5%).

Table 4.1 indicates that the 400 text dependent questions in the Ginn represented a larger portion of the Ginn sample (87.3%) than the 107 text dependent questions in the Nelson (67.8%). When comparing the nature of these text dependent questions, as portrayed in Table 4.2, a larger portion of the Nelson questions involved complex mental processing (76.6%) than in the Ginn (61.0%).

Information in Table 4.4 indicates that both programs presented a similar division between sequenced,

topic-related, and unrelated questions. Although approximately 35.4% of the questions in the Ginn sample and approximately 31.6% of the questions in the Nelson sample were organized in purposeful sequences, the programs presented different emphases. As indicated in Table 4.7, sequenced questions from the Nelson manuals tended to be fairly evenly divided between complex processing (36.0%), simple processing (36.0%), and text independent questions (28.0%). Ginn manuals placed the greatest emphasis on simple processing questions (55.5%), followed by a lesser emphasis on complex processing (35.2%) and finally the least emphasis being placed on text independent questions (9.2%).

Table 4.8 indicates that both Ginn and Nelson manuals carried a higher percentage of text dependent questions aimed at comprehension development rather than assessment. This emphasis was stronger in Nelson manuals with 76.6% of the questions aimed at development as compared to 61.0% of the questions in the Ginn. When considering which comprehension development questions were more or less facilitative of this goal, findings indicated that more facilitative comprehension development questions were evident in 16.8% of the Nelson sample and in 14.3% of the Ginn. Approximately 39% of the Ginn sample and 23.4%,of the Nelson sample were questions aimed at comprehension assessment.

4.6 Summary of Findings

4.6.1 Combined Research Sample

1. Complex processing questions, which require the reader to select and organize information, were emphasized to a greater extent (64.4%) than simple processing questions (35.6%)in the total sample of text dependent questions.

2. Questions requiring the complex mental processes of inferring, hypothesizing, and/or predicting represented the largest portion (33.7%) of the text dependent question sample.

3. One quarter of the total sample of text dependent questions questions required mental processes such as explaining, restating/translating, and/or comparing/contrasting (*B* category questions). Following closely were questions requiring little mental processing (*Rh* category questions).

4. Approximately one eighth of the sample questions called for explicitly cued answers (*A* category questions) followed by a minimal number (28), emphasizing internal and external evaluations (*D* category questions).

5. A total of 212 questions were used in 94 sequence patterns and 54 questions were used in 22 topic related group patterns. Out of the total research sample of 616 questions, approximately 34.4% were organized in sequences and 8.8% in topic-related groupings. The remaining 56.6% of the questions were presented individually, without any form

of organization.

6. Sequence patterns were most frequently composed of two questions; the first, focussing on a topic and the second, lifting thought by calling for an explanation of information generated from the preceding question.

7. Approximately 50.9% of all sequenced questions called for simple mental processing. Most of these question were from the *Rh* question category, and therefore required the reader to choose some prescribed opinion stance and/or to support or defend that opinion.

8. A larger percentage of questions (64.3%), in the basal manuals, developed rather than assessed comprehension skills and concepts.

9. Approximately threee quarters of the comprehension development questions were not organized or sequenced in a manner that was most facilitative of comprehension development.

4.6.2 Individual Research Samples

1. A larger portion of text dependent questions were located in the Ginn sample (87.3%) than in the Nelson sample (67.8%).

2. Ginn and Nelson question samples displayed different internal properties. Approximately 61% of the text dependent questions in the Ginn sample were of a complex processing nature as compared with 76.6% in the Nelson sample.

3. Individual Ginn and Nelson samples were similar in that approximately the top 80% of the text dependent questions were in categories *B*, *C*, or *Rh*. The order of category concentration was not the same for both programs.

4. Text independent questions were emphasized to a greater extent in the Nelson sample (32.3%) than in the Ginn sample (12.7%).

5. Text independent questions which provide background for reading were used to the greatest extent in both Ginn and Nelson samples.

6. At least half of both the Ginn and Nelson samples were composed of organizationally unrelated questions. Similar percentages of sequenced questions and topic-related groupings of questions were evident in both program samples.

7. The focus-lift sequence pattern was most frequently used in both samples of sequenced questions.

8. The most common question, used in 9/10 of the sequence patterns of individual Ginn and Nelson question samples, was the forced choice *Rh* question. This simple processing question was emphasized twice as much in the Ginn sample as in the Nelson.

9. At least half of the sequenced Ginn questions were of a simple processing nature whereas sequenced Nelson questions were fairly evenly divided between simple processing, complex processing, and text independent questions.

10. The Nelson questions emphasized comprehension development to a greater extent (76.6%) than the Ginn questions (61.0%).

5. CONCLUSIONS AND IMPLICATIONS

The purpose of this study was to analyze the questioning strategies employed in the teacher manuals of two Canadian basal reading programs. The analysis encompassed the nature of thinking processes required as well as the organizational patterns used in the comprehension questions.

This chapter presents a review of the study and a discussion of conclusions formulated from the research findings. Implications of these findings will be discussed in relationship to instructional practices and to further research.

The study was an analysis of the questioning strategies in the Ginn and Nelson teacher manuals of reading programs at the grade five level. One problem which faced the researcher was the lack of an appropriate system for examining the nature of the comprehending process required by questions in the manuals. For this purpose, the Question Categorization System was developed. Information was drawn from Cunningham's (1971) work on question-asking skills, along with Pearson and Johnson's (1978) description of question-answer relations and then synthesized with the writer's own thinking. Ultimately a five-part category system was developed, aimed at capturing the relationship between the author's internal text information and the reader's external information drawn from any of the following sources: (1) the reader's prior knowledge and

experience, (2) the reader's subjective ideas, biases or preferences, and/or (3) any prescribed opinion stance embedded in a teacher's question. A question was categorized on the basis of the sources of internal and external information required in the answer, as well as the type of cognitive processes required of the reader.

Comprehension questions pertaining to 56 selected stories and poems were transcribed for analysis. Selections, that is the children's stories, were equally divided between the Ginn and Nelson programs, however, 458 questions were attached to those stories and poems located in the Ginn and 158 questions to the Nelson sample, providing a total research sample of 616 questions. Questions were considered to be either text dependent, that is not answerable without knowledge of the written text information, or text independent, that is being answerable without knowledge of the content of the selection.

All comprehension questions were transcribed and grouped as either text dependent or text independent. Text dependent questions were categorized, according to the Question Categorization System, into five possible question-answer relations. Text independent questions were summarized according to four purposes and frequencies calculated.

The research data was then studied for the presence of planned sequences and strategies. All comprehension questions were re-analyzed for a Taba (1965) question

sequence, of focussing, extending and lifting questions, aimed at developing students' thinking abilities. The associated question category was tabulated along with each question that was part of a sequence.

5.1 Conclusions

5.1.1 Research Question One

What thinking processes are required by the reading comprehension questions in the basal manuals?

Complex mental processing questions, which involve the reader in the selection and organization of information when generating answers, represented a major portion (64.4%) of the total sample of comprehension questions. Highest priority (33.7%) was placed on questions requiring the complex mental processes of inferring, hypothesizing, and/or predicting. Second place emphasis (25.1%) was given to complex mental processing questions of explaining, restating, translating, and/or comparing, contrasting. Nearly the same emphasis (23.2%) was placed on questions which involve little mental processing, since the reader is forced to choose an option embedded in the teacher's question when providing an answer. Questions with answers that are explicitly cued by the grammatical structure of the text were evident in 12.4% of the sample. The remaining 5.6% of the total sample was represented by questions calling for internal or external evaluations.

Previous research has indicated that most questions in teacher's manuals require literal level comprehension (Cooke, 1970; Hatcher, 1971; Nicholson, 1977; Mueller, 1972; and Rosecky, 1977). Findings from the present study may not be directly compared with that of other research because of differences in the analysis instrument used. Barrett's Taxonomy (1968) has frequently been used as an instrument for investigating levels of comprehension questions in teacher manuals (Cooke, 1970; Hatcher, 1971; Nicholson, 1977; and Baker, 1980).

The Question Categorization System, used in the present research, differs from the Taxonomy in several ways. First, the purpose of the System was to focus on the processes a reader might engage in when organizing information internal and external to the text, rather than to determine the products of thought a reader might arrive at as a result of the comprehending process. Several category variations exist as a result of this differing purpose. A *B* category question of complex processing nature would probably be classified by Barrett as a literal level question. Despite the fact that these *B* category questions require the reader to select and organize information only from the text, this text information is not obviously organized for the reader as it is in the literal level *A* category question. For this reason the reader must move beyond thinking at a purely literal level.

The inclusion of the *Rh* category in the Question Categorization System is another factor which may not allow for direct comparisons between the present findings and those of previous research. Researchers, using other question categorization systems, might classify some *Rh* questions as evaluation questions. Under Cunningham's (1971) scheme, these questions would be considered to be of a narrow, although evaluative nature. Although an evaluation might be the end product of an *Rh* question, if these questions merely require yes/no responses or the choice of an embedded option in the question, then it is apparent that little mental processing may need to be engaged in by the reader.

Despite the differences in categorization procedures between the present study and previous ones, it is apparent that the editors of manuals for two Canadian basal reading programs need to be commended for the quality of most questions used in the comprehension methodology of basal manuals. Althouth there were at least 118 questions which were so ineffectively phrased that student thought would be minimal (*Rh* category), there was evidence of a definite reduction in the number of literal level questions, which have characteristically predominated the manuals of basal programs. This finding indicates an improvement in the nature of questions previously used in the comprehension methodology of basal manuals.

5.1.2 Research Question Two

To what extent are comprehension questions organized into purposeful sequences for developing students' comprehension?

A thinking sequence has been considered to be made up of a purpose, direction and outcome (Russell, 1956). This point of view provided a rationale underlying the importance of organizing questions into purposeful sequences. Research findings indicated that over half (56.8%) of the questions did not appear to relate to other questions in order of presentation. A small portion (8.8%) related to common topics, however, only 212 or 34.4% of the questions were organized in what appeared to be actual question sequences. Bearing in mind the importance of questions as an environmental influence on thought development, one must ask why such a small percentage of questions show evidence of purposeful organization.

The organizational pattern most commonly used in sequencing questions was the focus-lift pattern (57.5%). A strength of this type of organization is that students are being guided or stimulated to shift their thought to a higher level. A weakness, however, lies in the fact that the reader is not given an opportunity to broaden the knowledge base before a shift in thinking occurs. The focus-extend-lift sequence pattern, which was used 10 times or in 10.6% of the sequences, would be more facilitative in allowing students to gather a sufficient foundation upon which to refine and develop their thought.

Questions may be extensively and effectively organized, yet if the actual questions utilized in the sequences are not facilitative of thought development, then little will be gained. This is the primary weakness of the comprehension question sequences which were analyzed in the present study. Simple processing questions, which represented a major portion of the total sequenced questions, were primarily in the *Rh* category. Since *Rh* questions force the reader to choose a prescribed opinion stance before the child has had a chance to call up or assemble the necessary data to formulate an answer, it is dubious to even consider these as representative of actual sequences. "Pseudo-sequences" would be a more useful term to apply to these examples since outwardly the question organization conforms to the definition of a question sequence but inwardly does little to fulfill the ultimate goal of developing the students' comprehension. However, since question sequences were considered to exist when a question is related to, dependent on and develops information in the preceding one, the *Rh*, and *Rhs* questions had to be included in the analysis of question sequences.

5.1.3 Research Question Three

To what extent do the questions develop rather than assess comprehension skills and concepts?

The portion of comprehension questions, drawn from Canadian basal programs and analyzed in the present study,

indicated that comprehension assessment is not as prevalent in the methodology as had been indicated in previous, more extensive studies of this issue (Durkin, 1979; 1981).

An analysis of the question sample indicated that approximately 64% of the text dependent questions could be considered to stimulate comprehension development, rather than to provide for comprehension assessment. Within this group, however, only 75 or 14.8% of the questions appeared to be operating at full potential. This was contrasted with the other 251 questions or 49.5% which required complex mental processing, however, because of the absence or organized sequences provided a less facilitative means of developing comprehension. The present research indicated that despite the positive emphasis on questions which develop comprehension, the majority of the questions could be further improved to achieve this goal more effectively.

These findings led to the conclusion that questions need to not only engage a student in a variety of complex thinking processes, but also should be purposefully sequenced to provide for maximum thought development. Lack of question sequences appear to be a major area of weakness in the teacher manuals which were analyzed in this study.

5.1.4 Research Question Four

How are the reading programs alike or different in the information provided for developing comprehension?

Individual Ginn and Nelson samples differed in that Ginn manuals carried a larger portion (87.3%) of text dependent questions than Nelson manuals (67.8%). Approximately 61% of the text dependent Ginn questions were of a complex processing nature as compared to 76.6% of the Nelson questions. There was more of an emphasis on text independent questions in the Nelson manuals (32.3%) than in the Ginn (12.7%).

Simple mental processing questions from the *Rh* category were emphasized twice as much in 90% of the sequenced Ginn questions as in the sequenced Nelson questions. Ginn and Nelson samples differed in the distribution of simple processing, complex processing, and text independent questions which were sequenced. Nelson questions were fairly evenly distributed between these three possibilities whereas at least half of the Ginn questions were of a simple processing nature. Comprehension development questions were emphasized to a greater extent in the Nelson sample (76.6%) than in the Ginn (61.0%).

Ginn and Nelson questions were similar in several areas. Approximately the top 80% of the text dependent questions in both samples were from categories *B*, *C*, or *Rh*. In both samples, the greatest emphasis was placed on text independent questions which provide background for reading. Organizationally unrelated questions were evident in at least half of both samples. Ginn and Nelson samples were composed of similar percentages of sequenced questions and

topic-related groupings of questions. The focus-lift sequence was the most common organizational pattern used in both samples.

These findings led to the conclusion that the Ginn and Nelson program manuals are alike in some respects but differ in specific areas with regard to the information provided for comprehension development.

5.2 Implications

5.2.1 Teaching

Differences in the number of actual questions as well as in the number of suggestions about question topics should be considered, in conjunction with teacher experience, when selecting appropriate classroon materials. Manual suggestions to the teacher about questions may have either convergent or divergent outcomes, depending on the questioning expertise of the teacher. For example, the previously cited suggestion - "Ask them to decide if there is any truth to part of the story" - might be presented as a question requiring either simple or complex mental processing. A novice teacher, inexperienced in questioning techniques, might pose a forced choice, *Rh* question such as: "Is this a true story?" The more experienced teacher, however, might cause the child to gather information and evaluate by asking, "What parts of the story might have been

true?" "What parts might have been untrue?", thereby guiding the student to form a reasoned evaluation of the truthfulness of the story.

Since the Nelson manuals do not provide as much explicit guidance in questioning, the program may be appropriate for the more experienced teacher, with skill in developing question sequences. If the Nelson program is selected for use by inexperienced teachers then teacher supervisors might need to supplement the questioning information with inservices or even specific guidance on the use of questioning techniques for comprehension instruction.

The differing emphasis on text independent questions is another area that should be considered regarding teacher use of the basal programs. Text independent questions serve an important function in achieving a mind-set, developing anticipation of concepts or new vocabulary and in some cases, "calling up" prior knowledge of information that will be encountered when reading. The importance of an individual's knowledge base, in determining the complexity of one's thinking, is an idea that is emphasized in Peel's writing on cognitive development. In fact, Peel (1960) considered questions to be effective only up to the point that the child's prior knowledge and experiences have been sufficiently expanded. Reading experts emphasize the importance of providing reading readiness instruction for all grades at all grade levels (May, F. and Eliot, S., 1978, p. 281) as a means of expanding a students' knowledge base.

When using the manuals, a teacher may need to consider the sufficiency of text independent questions provided for developing students' knowledge bases. Expansion of what is provided may be in order.

A significant portion of the sampled questions (*Rh* category) were phrased so that the reader was left to choose some possible option embedded in the teacher's question, or to agree or disagree with some opinion presented. Since these characteristics were present in at least half of the questions which were sequentially organized and represented 23% of the total text dependent sample, it follows that rephrasing of these questions would significantly contribute to an improvement in the comprehension methodology of these basal manuals. Revised versions of these forced choice questions would easily result in increased opportunities for students to use such complex mental processes as evaluating, inferring, predicting, or hypothesizing.

Rh questions deliberately restrict children's thinking. These simple processing questions force the student to make a decision before being given an opportunity to call up or assemble the necessary data to formulate an answer. It would be much more effective if children were guided in developing the heuristic of calling up the data first and then using that information as the basis for providing a reasoned conclusion. One might question how ethical it is to require a student to defend a position that he/she has been forced to take from a preceding question.

Question sequences were considered to occur when a group of questions were ordered so that one was dependent on and developed information from preceding questions. Half of the questions contained in sequences required simple mental processing, most commonly evoking forced choices of some prescribed opinion stance embedded in a teacher's question. The most common sequence patterns were composed of focussing questions followed by lifting questions aimed at eliciting additional information at higher levels of thought. Many focussing questions used in this particular sequence were such that they forced the reader to assume an opinion stance without prior questions to assist the assembly of necessary information for answering. In these instances the lift question conformed to the researcher's definition of a sequence, however such cases did not accomplish the goal of a sequence - that of expanding, developing, and lifting student thought. As such, these particular lift questions forced defence of a closed issue where the decision had been made before evidential data could be studied. For this reason many of the sequence samples located, would have to be considered as "pseudo-sequences"; outwardly fulfilling a definition but in reality failing to function according to the defined purpose of developing thought.

Some of the following examples illustrate how easily an *Rh* question may be revised into more effective questions which require complex mental processing of a student. The first example is drawn from the Nelson questions for "Jack

and the Unicorn".

Rh: "Do you sympathize with Jack or with his mother or with both?" (McInnes and Hearn, 1977, 195)

As it stands this is a forced choice question regarding where sympathy might lie. Other emotional responses are not admitted. It might be reworded to an internal evaluation question (*DII*) allowing divergent emotions to be expressed and inviting multiple answers such as in the following:

"What kind of feelings did you have toward Jack and his mother?"

Two related questions from the same story were:

Rh: "Did you believe that Jack really did meet a unicorn?"

Rhs: "Why or why not?" (McInnes and Hearn, 1977, p. 195)

These questions might be combined into the following *C* category question, requiring the student to hypothesize:

"Why might Jack have thought that he had really met a unicorn?"

Questions related to the Ginn story, "Wait Till Martin Comes" might be revised in the following manner.

Rh: "Did you enjoy the story?"

Rhs: "Why or why not?" (Moore, 1974, p. 45).

The original goal of guiding the student to generally evaluate a story might be more effectively accomplished by any of the following *DI* questions followed by support.

"How did you feel about this story? Why?"

"What did you think of this story?"

"Why do you think this story is included in our reader?"

"What parts of this story did you feel strongly about?

"Why?"

These examples serve to illustrate the potential effectiveness of many questions used in the Ginn and Nelson manuals, especially within those which have been incorporated into a sequential organization.

5.2.2 Publishers

Some of the previous implications might be applicable for both teachers and publishers. There are certain issues which are of specific relevance to publishers. These are discussed in the following section.

Approximately one third of the questions in individual program samples were organized into sequences. In terms of the overall quantity, both the Ginn and Nelson manuals indicated the potential for a much more purposeful organization of questions. Comprehension development would be greatly facilitated if complex processing questions were organized into a greater number of lifting sequences. A useful pattern of this nature would <u>focus</u> on a topic; <u>extend</u> student thought by eliciting additional information on the subject; and <u>lift</u> the discussion to a higher level of thought through transitioning from the assembly of descriptive information to the explanation of certain items in the information.

Since questions represent such a major portion of comprehension methodology and since the quality of questioning practices is often low, it follows that instructional practices might be improved if manuals contained specific information on the nature of quality questions and questioning techniques. Teachers should be provided with a rationale, examples and instruction on how to develop well phrased questions and how to effectively organize them into purposeful sequences. This would provide a professional development resource, allowing for long-term influences on teacher praactices in reading instruction as well as in the other subject areas.

5.3 Suggestions For Further Research

The research sample in the present study was gathered after stories and poems had been organized according to common genre. Since the number of selections taken from each genre was not identical, it was impossible to discuss the comprehension questions on the basis of genre type. Further research might involve larger samples from specific genre so that the nature and sequencing of questions used in selections from one particular genre might be compared with the questions used to develop comprehension of selections from another genre. For example, it would be helpful to know what strategies are being used to develop students' comprehension of information material as compared to that

used with traditional tales of a culture.

A second area that was not covered in the present research is the extent to which the manuals guide students in generating their own questions. The "self-posed question" was a term used by Jenkinson (1968) to describe an effective means of stimulating children to think for themselves. Singer and Donlan (1980) described this process as "active comprehension" whereby the teacher first models a process of comprehension, by taking students through a discussion strategy, and then transfers the responsibility to the students to learn to formulate self-directing questions. This would be an important area to study in any further research on basal reading materials.

5.4 Concluding Statement

Previous research has indicated that the comprehension questions in basal programs are most frequently at a literal level. The present study, of the questions in two Canadian basal manuals indicated that some progress toward improving the quality of comprehension questions has been achieved. If these manuals provide a representative sample of the comprehension questions provided in current reading materials, then it appears that there is still a good distance to go. Four areas which require improvement are: (1) the organization of questions into purposeful sequences; (2) the rephrasing of questions to eliminate narrow, forced

choice answers; (3) the provision of instructive information to teachers on the phrasing of quality questions, as well as on the use of purposeful sequences and strategies; and (4) the expansion of external information questions which might serve to develop children's thinking.

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7. APPENDIX A

TITLES AND PAGE NUMBERS OF ALL STORIES AND POEMS IN THE GINN AND NELSON GRADE FIVE READING PROGRAMS, DISTRIBUTED WITHIN SIX TYPES OF GENRE

GENRE: I. Traditional Tales of a Culture
(Folk Tales, Fairy Tales, Myths)

Ginn

Level B: First Book

The Dog Who Chose a Prince	10
The Mischievous Dog	50
The Wolves and The Dogs	51
The Tower of London	61
The Cabbage Princess	74
The One You Don't See Coming	104
The Four Silver Pitchers	130
Eskimo Carvings and Stories	181
The Knights of the Silver Shield	200

Level B: Second Book

The Bear Who Stole the Chinook	37
How Pan Ku Made the World	45
The Beginnings of Man	48
The Beginning	51
The Trojan Horse	56
Why The Beaver Has a Flat Tail	66
The First Snowfall	67
I Wonder why There Are Seven Days In a Week	67
In Russia The People Say	69
From the Dictionary of Magical Beasts	72
The Potlatch	158
The First Quest of the Round Table	186
The Flying Machine	195

Nelson

Northern Lights and Fireflies

How the Birds Got Their Colors	19
The Talking Cat	73
The Raven and the Whale	158

Kites and Cartwheels

Genre: II. Fantasy
(Magic, Science Fiction)

Ginn

Level B: First Book

Wait Till Martin Comes	59
What Can You Do With a Word?	68
The King D'The Cats	117

Level B: Second Book

Frankenstein Creates and A Monster	100
The Greatest Monster of Them All	102
Jack and the Unicorn	165

Nelson

Northern Lights and Fireflies

The Wonderful Machine	118
The Whopping Big Tale of Herman the Whale	148

Kites and Cartwheels

Ghost Go Lightly	51
The Old Man Who Said "Why"	97

Genre: III. Historical Fiction
(Pioneers, Middle Ages, Political Intrigue)

Ginn

Level B: First Book

St. George and The Fiery Dragon	210
Philburt the Fearful	226

Level B: Second Book

Nelson

Northern Lights and Fireflies

Kites and Cartwheels

Genre: IV. Contemporary Fiction
(Human Relationships, Social Problems)

Nelson

Ginn

Level B: First Book

A Struggle in the Woods 20

The Bully of Barkham Street 32

Parakeet Problem 111

Level B: Second Book

An Ice Baby is Born 10

The Strange Bird 109

Leopard Bait 116

From Owls in the Family 131

Wild Bird 142

A Funeral For Constable Cameron 172

Northern Lights and Fireflies

Sandro the Super-Size Siamese 53

Flashback 88

RootBeer 96

All Fall Down 108

A Good Tree That Christmas 183

The Three Mummers of St. Mary's 205

Kites and Cartwheels

My Josephine 17

Between the Creeks 38

The Kite 66

Stan, the Helicopter Pilot 74

What's a Poem, Anyhow? 107

Tracking Down Elephants in Northern Ontario 119

A Funny Thing Happened to Mr Gravely on His Way Through St. Louis du Ha! Ha! 128

Counterfeit Horse 142

On the Trail to Lost Lake 153

Bonjour 173

River Rescue 190

Genre: V. Information Books
(Non-Fiction Biography, Factual Subject Matter)

Nelson

Ginn

Level B: First Book

The Railroad Ghost 55

Water 90

Mysterious Questions and Answers 120

Designing Your Own Wrapping Paper 142

Pabco Picasso 154

Travelling With Dogs 166

Eskimo Art Activities 188

From First Under the North Pole 191

How About a Dragon For a Pet 218

Feudalism 221

Level B: Second Book

The Metro Toronto Zoo 23

Once Long, Long Ago 44

Werewolves 80

The Beast of Baluchistan 82

Who Would Dare Distrub the Sleep of A Mummy 90

Fishes Dangerous to Man 92

Fun With Leaves 114

How to Grow Your Own Trees 126

The Smoking of the Peace Pipe or Calumet 164

Young Canadian Heroes 203

From Happy Days 210

Let's Celebrate 219

Northern Lights and Fireflies

The Whale Killers 163

Kites and Cartwheels

Granny Goes Flying on Six Kites 72

Amelia Earhart First Lady of Flight 90

Genre: VI. Poetry
(Ballads, Rhymes, Lyric Poems, Games and Limericks)

Ginn

Level B: First Book

An Introduction to Dogs	9
The Teacher	28
The Dog's Cold Nose	29
The Large and the Small of It	31
Night Shapes	53
Autumn Ghost Sounds	64
The Witches Ride	65
Associations	67
Limerics	88
Silent Hill	103
Little John Bottlejohn	114
The Artists	129
Dream Dust	141
Children's Creations	144
Haiku	165
Eskimo Poetry	178
Knights and Ladies	199
Thunder Dragon	220

Level B: Second Book

A Warning About Bears	9
My Brother Bert	22
Limericks	41
V is for Valhalla	43
Not Me	71
The Hippocrump	78
Doug Wright's Family Tree	105
Have You Seen Trees	105
The Cabin	106
Simple Was My Lodge of Birch	125
My Mocassins Have Not Walked	139
O Great Spirit	141
The Scarecrow	156
There Is Bannock in the Morning	157
Speed	162
To a Deer Slain By a Hunter	163
A Song of Greatness	169
The Charge of the Light Brigade	171
The Microscope	191
Days	194
February Twilight	209
Spring Waits for Me	216
	217

Nelson

Northern Lights and Fireflies

Northern Lights	6
Haiku	8
All About Fireflies	9
The Skies of the Night	10
Jack Remembers	11
The Northern Cold	12
Arctic Rhododendrons	13
A Choral Fantasy	14
November 28, 1893	30
December 22, 1895	31
Cat From Window	48
Cat From Street	49
The Cat	50
Bimbo's Poem	51
The Prayer of the Cat	52
On a Night of Snow	70
A Feline Silhouette	72
The True Mirror	86
The Whale	146
Chanson Innocente	180
West Coast Woods at Christmas	182

Kites and Cartwheels

Kites	6
Cartwheels	8
Listen!	10
Foghorns	12
The Saws Where Shrieking	14
The Small Drum	16
Early Autumn	32
Sudden Music	33
Artic Sounds	34
Grease for the Wheels of Winter	35
Cinderwind	36
Crescendo	49
Ghost Story	50
Flight East	64
I, Icarus	65
On and On Beyond Whitemud and Stone Pile Post	88
Model Plane	94
Search-Know	96
What Did You Say	118
Understanding	164

Genre: VII. Drama

Ginn

Level B: First Book

Nelson

Northern Lights and Fireflies

All the Time in the World	124

Level B: Second Book

Kites and Cartwheels

From Out of the Blue	199

8. APPENDIX B

MANUAL FOR QUESTION CATEGORIZATION SYSTEM

Introduction

This manual is written for the purposes of establishing inter-rater reliability as well as for assisting those who may use it to analyze comprehension questions in reading materials.

The Question Categorization System provides a tool for organizing various types of reading behavior which are determined by the sources of information used in the thinking processes promoted by comprehension questions. The System may be used for evaluating the types of questions suggested in educational materials as well as to provide quidelines for effective phrasing of questions. The Question Categorizations System, adapted from Cunningham's (1974) four level question schema and from the Pearson and Johnson (1978) three part model of question-answer relations, is composed of five possible categories of questions.

The questions categories, labelled as *Rh*, *A*, *B*, *C* and *D* may involve either complex or simple mental processing. Questions which involve simple mental processing are in the *Rh* and *A* categories. These require selection but little or no organization of information from the text or the teacher question when generating an answer. Questions which involve complex mental processing are in the *B*, *C*, and *D* categories. These require the reader to: (1) select information from sources internal and/or external to the text, (2) organize the information and (3) present a reasoned conclusion to the question.

Rh Category (Simple Mental Processing)

Data Base for Answer:

- teacher question, which is also based on the text information.

Description of Cognitive Process:

- reader chooses a prescribed opinion stance from one or the other option embedded in the teacher's question.
- answer may be: (1) Yes or No
  (2) an element selected from the teacher's question.

Possible Cognitive Operations:

1. Choose.

Response Requirement:

- one acceptable answer.

Subcategories:

- *RhI*: The reader chooses a prescribed opinion stance.
- *RhIs*: The reader supports a prescribed opinion stance that has been given.

Examples of *Rh* Category Questions

1. *RhI*:

"Do you think that a rabies epidemic would be more dangerous in the north or in a town where there was a larger population?" (McInnes and Hearn, 1977, p. 113)

2. *RIs*:

"Why or why not?" (McInnes and Hearn, 1977, p. 113)

3. *RhI*:

"Do you think the old woman was who she appeared to be?"

"Could she have been sent to lure Sir Roland away from the castle?"

4. *RhIs*

"Why or why not?"

A Category (Simple Mental Processing)

Data Base for Answer:

- text information

Description of Cognitive Process:

- reader draws specific information from the text to form *one* correct answer.
- reader is not required to organize any of the text information.
- part or all of the question may be embedded in the language of the text.
- may recall facts, definitions, or other remembered information from the text.
- may identify the number of the page and paragraph that a specific piece of information is contained on.
- may define a term or word that has been explicitly defined in the text.
- may name or list people, objects, or characteristics which have been explicitly stated in the text.

Possible Cognitive Operations:

1. Recall
2. Identify
3. Define
4. Name
5. List

Response Requirement:

- one acceptable answer.

Examples of *A* Category Questions

1. Recall

Question:

"Why would the leopard lurk close to the trail?" (Moore, 1975, p. 116)

Text:

"The leopard would lurk close to the trail between the villages, because that was where he would find lone travellers." (Moore, 1974, p. 188)

2. Identify

Question:

"Find and read aloud parts of the story that tell you that Martin understood a great deal about his own behaviour." (Moore, 1974, p. 25)

3. Define

Question:

"What is a throttle?"

Text:

"A throttle is a valve used to regulate the flow of steam or gasoline vapor to an engine."

4. Name

Question:

"Who comes to the cottage?" (McInnes and Hearn, 1977, p. 84)

Text:

"The old woman took the lamp from the low table and went to the door. She opened it slowly. The light from the lamp shone on a queer old man who had the unmistakable look of

the woods. (McInnes and Hearn, 1971, p. 74)

5. List

Question:

"What surprises did he find inside the whale?" (McInnes and Hearn, 1977, p. 151)

Text:

"And there right in the whale's stomach the raven was amazed to see a large confortable cabin. Inside it a lamp was burning brightly, and its walls and floors were covered with soft hides. Along the wall there was a spacious skin platform covered with fur. And there resting on the skin platform was the most beautiful young woman the raven had ever seen." (McInnes and Hearn, 1971, p. 139)

B Category (Complex Mental Processing)

Data Base for Answer:

- text information

Description of Cognitive Process:

- reader selects and organizes relevant facts from the text.
- reader puts the text information into a logical and sequential order, in order to contstruct a reasoned conclusion.
- all of the information necessary to arrive at an answer is given in the text.
- reader may explain something by inter-relating the facts that are stated in the text.
- reader may restate or translate text information in a form that is different from what has been given in the text.
- reader may select relevant facts for the purposes of comparison and contrast.

Possible Cognitive Operations:

1. Explain
2. Restate/Translate
3. Compare/Contrast

Response Requirement:

- few acceptable answers.

Examples of *B* Category Questions

1. Explain

Question:

"Why did she allow him to come in?" (McInnes and Hearn, 1977, p. 84)

Text:

"At last she said, "Then come in. It is rare for a cat to be able to talk that I'm sure one should listen to him when he does." (McInnes and Hearn, 1971, p. 76)

2. Restate/Translate

Question:

"What does he offer to do?" (McInnes and Hearn, 1977, p. 84)

Text:

"I seek shelter and work," answered Pierre Leblanc. "I am getting too old to trap for furs or work in the lumber camps. I would like a job on just such a cozy little place as this." (McInnes and Hearn, 1971, p. 74)

3. Compare/Contrast

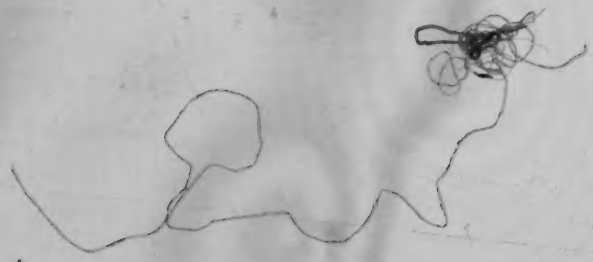
Question:

"In what ways do you think Rufus and Martin were alike?" (Moore, 1974, p. 24)

Text:

"... when Rufus was barking furiously, straining and leaping at the end of the run. 'It reminds me of when you were a little boy, Martin. We had the whole backyard fenced in the way it is now, just so you'd have a lot of space to play in and still be safe. But were you satisfied? You were not.

You'd plaster yourself against the gate and yell louder than Rufus there.'" (Moore, 1973, p. 38)



C Category (Complex Mental Processing)

Data Base for Answer

- text: written information
- external: reader's background knowledge and experience

Description of Cognitive Process:

- reader analyzes and synthesizes the *text* information as well as information that is external to the text (personal background knowledge and experience), in order to come to a reasoned conclusion.
- elements are organized into patterns that were not clearly recognizable in the actual text information.
- reader may infer an answer by making best guesses about what the author must have meant, apart from what is explicitly stated in the text.
- reader may hypothesize a likely explanation for a particular phenomena or occurrence.
- reader may predict future events or, assumming if circumstances were altered, predict what the outcome would be.

Possible Cognitive Operations:

1. Infer
2. Hypothesize
3. Predict

Response Requirement:

- many acceptable answers.
- conclusion does not conflict with but is not directly derived from the text information.

Examples of *C* Category Questions

1. Infer

Question:

"What was the battle that Sir Roland fought and won?" (Moore, 1974, p. 164)

2. Hypothesis

Question:

"Why was it the hardest battle of all?" (Moore, 1974, p. 164)

3. Prediction

Question:

"What other situations might arise where Silver's life might be in danger?" (McInnes and Hearn, 1977, p. 113)

D Category (Complex Mental Processing)

Data Base for Answer

- text: written information
- external: reader's background knowledge and experience
- subjectivity: reader's personal ideas, biases, or preferences.

Description of Cognitive Process:

- organization of text information, reader's background knowledge and experience, and the reader's personal biases or opinions to form an evaluation based on internal (personal) or external (someone else's) criteria.
- reader may externally evaluate the author's ideas, story events, or story characters in light of one or more of the following criterion: fact or opinion, bias, point of view, truthfulness adequacy of information, worth, desirability, completeness, or acceptability.
- reader may defend or support an evaluation made by himself or an evaluation that has been set by information provided by the teacher in the question.
- reader may internally evaluate by giving an emotional response to the content, or identifying personally with story characters or events.

Possible Cognitive Operations:

1. Evaluate/Value
2. Defend/Support

Response Requirement:

- many acceptable answers, based on text data.

Subcategories:

- *DI*: The reader externally evaluates ideas, events and characters.

- *DIs*: The reader supports or defends an external evaluation.

- *DII*: The reader internally evaluates through an emotional response or identification with story characters.

DIIs: The reader supports or defends an internal evaluation.

Examples of *D* Category Questions

1. *DI*: (External Evaluation)

"What was your opinion of Martin after you read the entire story?" (Moore, 1974, p. 23)

2. *DIs*: (Support/Defence of External Evaluation)

"Why?"

"Why do you think Dracula has been so popular for so many years?" (Moore, 1975, p. 93).

3. *DII*: (Internal Evaluation)

"What would you have done if you had been lost as Tim was?" (McInnes and Hearn, 1977, p. 59).

"What feelings did you have as you read about Anne Boleyn and Katherine Howard?" (Moore, 1973, p. 49).

4. *DIIs*: (Defend/Support Internal Evaluation)

"Why?" (Moore, 1973, p. 49).

Categorization Procedures

1. Read story or poem as well as accompanying comprehension questions.
2. Transcribe comprehension questions on to analysis sheet.
3. Locate sections in the text that relate to the question and write the appropriate page and paragraph numbers for this information in the columns entitled "Text Base for Answer".
4. Determine the appropriate information sources that the reader might draw from in generating an answer. In the column, "Data Base for Answer", check off one or more of the following information sources: (1) Text; (2) Ext. (External) - reader's prior knowledge and experience; (3) Subj. (Subjectivity) - reader's personal subjective opinion; (4) T.Q. (Teacher Question) - options embedded in the question.
5. On the basis of the text base and the information sources used for answering the question, select the question category (*Rh*, *A*, *B*, *C*, or *D*) and check the appropriate column.
6. Write the specific cognitive operation (egs. choosing, recalling, explaining, inferring, evaluating) in the final "Notes" column.

Sample Analysis Sheet For Use With

Question Categorization System

Grade___ Series_____ Book_____ Story Title_____ M.pg.__ R.pg.__ Genre____

#	Question	Text Base for Answer		Data Base for Answer				Category					Notes
		C/IC		Text	Ext.	Subj.	T.Q.	Rh	A	B	C	D	

9. APPENDIX C

OUTLINE OF TEXT DEPENDENT AND TEXT INDEPENDENT QUESTIONS
FOR EACH STORY AND POEM IN THE RESEARCH SAMPLE

Outline of Text Dependent and Text Independent Questions

Page No. Guide		Title of Selection	Questions T.D.	T.I.
	I. Genre: Traditional Tales of a Culture			
	Northern Lights and Firefiles			
32	I-N-1	How the Birds Got Their Colours	7	0
60	I-N-2	The Talking Cat	14	0
93	I-N-3	The Raven and the Whale	6	0
		Total Nelson	27	0
	Spir b1			
48	I-G-1	The Tower of London	13	3
163	I-G-2	The Knights of the Silver Shield	38	6
	Spir b2			
24	I-G-3	The Bear Who Stole the Chinook	8	5
		Total Ginn	59	14

Outline of Text Dependent and Text Independent Questions

Page No. Guide		Title of Selection	Questions T.D.	Questions T.I.
	II. Genre: Fantasy			
	Northern Lights and Firefiles			
39	II-N-1	Spectrum's End	0	0
118	II-N-2	The Wonderful Machine	8	1
148	II-N-3	The Whopping Big Tale of Herman the Whale	0	0
	Kites and Cartwheels			
51	II-N-4	Ghost-Go-Lightly	5	10
165	II-N-5	Jack and the Unicorn	8	7
		Total Nelson	21	18
	Spir b1			
59	II-G-1	Wait Till Martin Comes	16	2
68	II-G-2	What Can You Do With a Word?	29	7
117	II-G-3	The King of the Cats	7	1
	Spir b2			
91	II-G-4	Frankenstein Creates a Monster	8	5
24	II-G-5	The Greatest Monster of Them All	10	2
		Total Ginn	65	12

Outline of Text Dependent and Text Independent Questions

Page No. Guide		Title of Selection	Questions T.D.	T.I.
		IV. Genre: Contemporary Fiction		
		Northern Lights and Firefiles		
100	IV-N-1	Flashback	7	1
107	IV-N-2	Rootbear	0	0
112	IV-N-3	All Fall Down	8	0
69	IV-N-4	Sandro, the Super-Size Siamese	12	6
		Kites and Cartwheels		
35	IV-N-5	My Josephine	7	0
59	IV-N-6	Between the Creeks	5	0
111	IV-N-7	Stan the Helicopter Pilot	5	0
		Total Nelson	44	7
		Spir b1		
23	IV-G-1	The Bully of Barkham Street	43	3
95	IV-G-2	Parakeet Problem	23	5
		Spir b2		
11	IV-G-3	An Ice-Baby is Born	25	3
110	IV-G-4	The Strange Bird	23	5
115	IV-G-5	Leopoard Bait	22	3
125	IV-G-6	Owls in the Family	18	1
141	IV-G-7	Wild Bird	20	0
		Total Ginn	159	19

Outline of Text Dependent and Text Independent Questions

Page No. Guide		Title of Selection	Questions T.D.	T.I.
		V. Genre: Traditional Tales of a Culture		
		Northern Lights and Firefiles		
158	V-N-1	The Whale Killers	0	1
		Kites and Cartwheels		
104	V-N-2	Granny Goes Flying on Six Kites	4	2
131	V-N-3	Amelia Earhart, First Lady of Flight	0	2
		Total Nelson	4	5
		Spir b1		
77	V-G-1	W-A-T-E-R	14	2
137	V-G-2	Travelling With Dogs	18	0
		Spir b2		
86	V-G-3	Fishes Dangerous to Man	10	3
		Total Ginn	42	5

Outline of Text Dependent and Text Independent Questions

Page No. Guide		Title of Selection	Questions T.D.	T.I.
	VI. Genre: Poetry			
	Northern Lights and Firefiles			
9	VI-N-1	Northern Lights	3	0
19	VI-N-2	Jack Remembers	0	0
58	VI-N-3	Cat From Street	0	0
79	VI-N-4	A Feline Silhouette	0	0
176	VI-N-5	Chanson Innocente	4	4
	Kites and Cartwheels			
9	VI-N-6	Kites	4	4
26	VI-N-7	The Saws Were Shreiking	0	0
54	VI-N-8	Grease for the Wheels of Winter	0	10
90	VI-N-9	I, Icarus	0	3
193	VI-N-10	Understanding	0	0
		Total Nelson	11	21
	Spir b1			
8	VI-G-1	An Introduction to Dogs	7	3
21	VI-G-2	The Large and Small of It	10	0
90	VI-G-3	Silent Hill	10	0
123	VI-G-4	Children's Creations	12	0
176	VI-G-5	Thunder Dragon	10	0
	Spir b2			
92	VI-G-6	V is For Volhalla	5	0
107	VI-G-7	Have You Seen Trees	5	0
119	VI-G-8	The Cabin	5	5
149	VI-G-9	There is Bannock in the Morning	1	0
177	VI-G-10	The Microscope	10	0
		Total Ginn	75	8

10. APPENDIX D

CATEGORY DISTRIBUTION OF TEXT DEPENDENT QUESTIONS

GINN SERIES

Story No.	Question Category								
	A	B	C	DI	DIs	DII	DIIs	Rh	Rhs
I-G-1	0	3	4	0	0	1	1	2	2
I-G-2	5	8	13	0	1	0	0	6	5
I-G-3	2	3	3	0	0	0	0	0	0
	7	14	20	0	1	1	1	8	7
II-G-1	1	0	4	0	0	1	0	6	4
II-G-2	1	3	17	2	0	0	0	3	3
II-G-3	0	3	2	0	0	0	0	1	1
II-G-4	0	0	3	0	0	0	0	0	0
II-G-5	1	3	0	0	1	0	0	3	2
	3	9	26	2	1	1	0	13	10
IV-G-1	7	5	12	2	0	3	1	9	4
IV-G-2	1	2	3	0	0	0	0	1	1
IV-G-3	11	9	2	0	0	0	0	2	1
IV-G-4	2	3	8	1	0	0	0	5	4
IV-G-5	2	5	13	0	0	0	0	1	1
IV-G-6	2	8	8	0	0	0	0	0	0
IV-G-7	0	4	12	0	0	0	0	2	2
	25	36	58	3	0	3	1	20	13
V-G-1	1	7	6	0	0	0	0	0	0
V-G-1	7	10	1	0	0	0	0	0	0
V-G-3	7	3	0	0	0	0	0	0	0
	15	20	7	0	0	0	0	0	0
VI-G-1	1	0	1	1	0	0	0	2	2
VI-G-2	0	0	6	0	0	0	0	2	2
VI-G-3	1	0	4	0	0	1	0	2	2
VI-G-4	0	0	10	0	0	0	0	1	1
VI-G-5	2	0	6	0	0	0	0	1	1
VI-G-6	3	2	0	0	0	0	0	0	0
VI-G-7	0	0	2	0	0	0	0	2	1
VI-G-8	0	0	3	0	0	0	0	1	1
VI-G-9	0	0	1	0	0	0	0	0	0
VI-G-10	0	2	0	0	0	1	0	5	2
	7	4	33	1	0	2	0	16	12
TOTAL:	57	83	144	6	2	7	2	57	42
% Total	14.3	20.8	36	1.5	.5	1.6	.5	14.3	10.5

NELSON SERIES

Story No.	Question Category								
	A	B	C	DI	DIs	DII	DIIs	Rh	Rhs
I-N-1	0	5	2	0	0	0	0	0	0
I-N-2	1	8	0	0	0	0	0	3	2
I-N-3	2	4	0	0	0	0	0	0	
	3	17	2	0	0	0	0	3	2
II-N-1	0	0	0	0	0	0	0	0	0
II-N-2	0	0	5	1	1	1	0	0	0
II-N-3	0	0	0	0	0	0	0	0	0
II-N-4	0	1	2	0	0	0	0	1	1
II-N-5	0	1	1	2	0	0	0	2	2
	0	2	8	3	1	1	0	3	3
IV-N-1	0	0	0	3	2	0	0	1	1
IV-N-2	0	0	0	0	0	0	0	0	0
IV-N-3	0	1	4	0	0	0	0	2	1
IV-N-4	0	11	1	0	0	0	0	0	0
IV-N-5	1	1	5	0	0	0	0	0	0
IV-N-6	1	1	2	0	0	1	0	0	0
IV-N-7	1	4	0	0	0	0	0	0	0
	3	18	12	3	2	1	0	3	2
V-N-1	0	0	0	0	0	0	0	0	0
V-N-2	0	1	3	0	0	0	0	0	0
V-N-3	0	0	0	0	0	0	0	0	0
	0	1	3	0	0	0	0	0	0
VI-N-1	0	3	0	0	0	0	0	0	0
VI-N-2	0	0	0	0	0	0	0	0	0
VI-N-3	0	0	0	0	0	0	0	0	0
VI-N-4	0	0	0	0	0	0	0	0	0
VI-N-5	0	3	1	0	0	0	0	0	0
VI-N-6	0	0	1	0	0	0	0	2	1
VI-N-7	0	0	0	0	0	0	0	0	0
VI-N-8	0	0	0	0	0	0	0	0	0
VI-N-9	0	0	0	0	0	0	0	0	0
VI-N-10	0	0	0	0	0	0	0	0	0
	0	6	2	0	0	0	0	2	1
TOTAL	6	44	27	6	3	2	0	11	8
% Total	5.6	41.4	25.2	5.6	2.8	1.9	0	10.3	7.5